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MODEL 4167-M2
DUAL MODULAR
SUBCARRIER DISCRIMINATOR

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FAIRCHILD WESTON SYSTEMS INC.
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DATA SYSTEMS DIVISION
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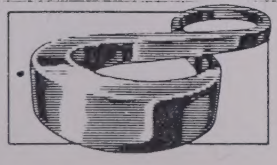
(813) 371-0811 • Telex 052 890 • TWX 810-864-0406

MODEL 4167-M2
DUAL MODULAR
SUBCARRIER DISCRIMINATOR

INSTRUCTION MANUAL

MAY 1976



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ADDENDUM

MODEL 4167-M2 SUBCARRIER DISCRIMINATOR

A.1 GENERAL

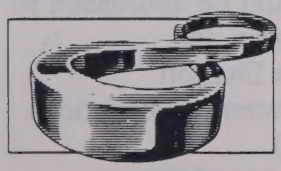
The M2 modification to the standard EMR 4167 is to provide a deviation of less than 2.5%. All other aspects of the M2 are identical to the standard unit.

A.2 IDENTIFICATION

The modified unit is identified by assembly number 28431.

MODEL EMR 4167
DUAL MODULAR
SUBCARRIER DISCRIMINATOR
(Revision C)

INSTRUCTION MANUAL



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NOTICE

IN THE EVENT THIS EQUIPMENT MUST BE RETURNED TO EMR FOR ANY REASON, SPECIAL CARE MUST BE EXERCISED IN PACKAGING FOR SHIPMENT. CARTON WITHIN A CARTON TYPE PACKING, WITH FOAM SUPPORT AND SEPARATORS IS RECOMMENDED TO PREVENT SHIPPING DAMAGE. SHOULD ANY INFORMATION BE REQUIRED REGARDING PACKAGING OF EMR EQUIPMENT, CONTACT EMR-TELEMETRY, SARASOTA, FLORIDA.

May, 1974

MANUAL CHANGE NOTICE #1

EFFECTIVITY: EMR Model 4167 serial numbers 1-32, 34-63, and 65-74.

DESCRIPTION: Resistor R16 on the Dual Discriminator Card is 3.57K for the earlier versions. This applies to both 1R16 and 2R16 on the card. The parts lists in Section 6 reflect this resistor value. Later versions of the card contain a 4.32K resistor in these locations. The card schematic diagram illustrates the 4.32K resistor. Part information for the 4.32K resistor is as follows:

R16 -- RESISTOR, 4.32K ± 1%, 1/10W, EMR No. 608-09-43200

May, 1974

MANUAL CHANGE NOTICE #2

EFFECTIVITY: EMR Model 4167R serial number 64 and up.

DESCRIPTION: The front-panel identification strips are changed such that only the reference frequency is included. This is identified in a single identification strip, the second strip is deleted.

May, 1974

MANUAL CHANGE NOTICE #3

EFFECTIVITY: Later versions of the Discriminator Cards.

DESCRIPTION: Integrated-circuit locations 1U2 and 2U2 are changed so that either of two types of integrated-circuit packages may be installed. Part information for the two integrated-circuit types is as follows:

1U2 or 2U2 -- Integrated-Circuit, Current Ampl., DC to 30 MHz, Vendor is Nat. Semi., Vendor Part No's. are LH0002CH or LH0002CN.

EMR MODEL 4167

LIST OF EFFECTIVE PAGES

Date of issue for basic is:

Basic . . . . . December 1973
Revision A . . . . . February 1975

Total number of pages in this manual is 86 consisting of the following:

Page No.	Rev. Letter
Title	A
A	Basic
i thru iv	Basic
1-1 thru 1-4	Basic
2-1 thru 2-8	Basic
3-1 thru 3-5	Basic
4-1 thru 4-7	Basic
4-8 and 4-9	A
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5-1 thru 5-11	Basic
5-12	A
5-13 and 5-14	Basic
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SECTION 1

GENERAL DESCRIPTION

1.1 INTRODUCTION

This manual contains information describing the EMR Model 4167 Dual Modular Subcarrier Discriminator. Also discussed is the associated reference discriminator and delay line (EMR Model 4167R). Included in this manual is a physical and functional description, specifications, installation and operation, theory of operation, maintenance, and replaceable and spare parts lists.

1.2 PHYSICAL DESCRIPTION

The EMR 4167 is a modular unit designed for installation in an EMR 4005 Rack Adapter. A rack adapter is intended for mounting in a standard 19-inch wide equipment rack. Vertical height required for mounting the rack adapter is 5-1/4 inches.

The interior of a rack adapter is divided into 14 modular increments. A 4167 occupies one modular increment. However, an EMR 4024 Power Supply is normally installed in a rack adapter to supply operating power for the remaining rack adapter equipments. Since the power supply occupies four modular increments, up to ten 4167's may be included in a rack adapter with the power supply.

There are two basic configurations of a 4167, a dual channel data discriminator and a single channel reference discriminator. Top assembly diagrams for these units are shown in Figures 5-1 and 5-2. More detailed views of the internal equipments are shown in the chassis assembly diagrams, Figures 5-3 and 5-4. Each 4167 data discriminator (Figures 5-1 and 5-3) contains provisions for two completely separate and independent discriminators as determined by the installation of channel selector cards (item 3 in Figure 5-3) and low-pass filter cards (item 4 in Figure 5-4). Other than these two card sets, all data discriminators are identical. The channel selector card and low-pass filter card (items 3 and 4) in the rear of the unit are for discriminator #1. Corresponding cards in the front of the unit are for discriminator #2. When only one discriminator is included in a unit, the two cards for discriminator #2 are not supplied.

All data discriminator channel selector and low-pass filter cards plug into a main discriminator card (item 2 in Figure 5-3). The main card is identical for all data discriminator configurations and is divided into two identical sections. The rear half contains components for discriminator #1, while the front half contains components for discriminator #2.

The data discriminator front panel is also divided into two identical sections. Components on the left side of the front panel (as viewed from the front of the unit) are for discriminator #1, while corresponding components on the right side are for discriminator #2.

The reference discriminator (Figures 5-2 and 5-4) is configured similarily except that the discriminator components are located on the front of the main discriminator card. A plug-in channel selector card (item 3 in Figure 5-4) and a plug in low-pass filter card (item 4 in Figure 5-4) are installed on the main discriminator card in the same manner as the data discriminators. The multiplex delay line card is mounted on the rear of the main card. The reference discriminator front panel contains a single set of operating components for the discriminator circuits.

A connector (J1) mounted on the rear of each unit chassis (Figures 5-2 and 5-4) terminates all external electrical connections for the unit. This connector mates with a corresponding receptacle in the rack adapter interior, completing the electrical connections to external equipments.

1.3 FUNCTIONAL DESCRIPTION

The 4167 contains one or two data discriminators, each of which is designed to extract a subcarrier channel from an FM multiplex and to detect any data in the channel. Detected data is supplied at the unit output in the form of analog voltages which may then be used for further processing or display. Multiple discriminators, each tuned to operate at different subcarrier frequencies, may be connected in parallel to recover the data contained in a real-time or a prerecorded FM multiplex. Typical real-time and playback system configurations are illustrated in Figure 1-1.

For real-time systems, the received FM multiplex is routed simultaneously to all data discriminators. In a playback system, the FM multiplex from a prerecorded tape may contain errors incurred during the recording or playback of a tape. To detect and provide compensation for these errors, an EMR 4167R Reference Discriminator may be used in the system.

The 4167R extracts the reference frequency from the recorded multiplex and detects any modulation of the reference frequency. This resulting modulation is supplied at the 4167R output as a tape-speed-compensation (TSC) error signal. The TSC error signal is then routed in parallel to all data discriminators. Since there is a signal delay in the reference discriminator, a multiplex delay line is included. This delay line delays the FM multiplex an amount equal to the delay through the reference discriminator. Therefore, the TSC error signal and the FM multiplex are applied to the data discriminators time-coincident.

The 4167 data discriminators can be configured to operate at center frequencies from 300 Hz through 300 kHz and deviations equivalent to ±2.5% through ±40%. Plug-in channel selector cards establish the subcarrier channel parameters. The deviation polarity is positive in that an increase of frequency at the input will result in an increase of voltage at the output. Plug-in low-pass filters establish the data cutoff frequency and the response characteristic. Cutoff frequencies from 5 Hz through 60 kHz may be selected with a constant amplitude or constant delay characteristic. Asymptotic rolloff beyond cutoff is 30 dB/octave.

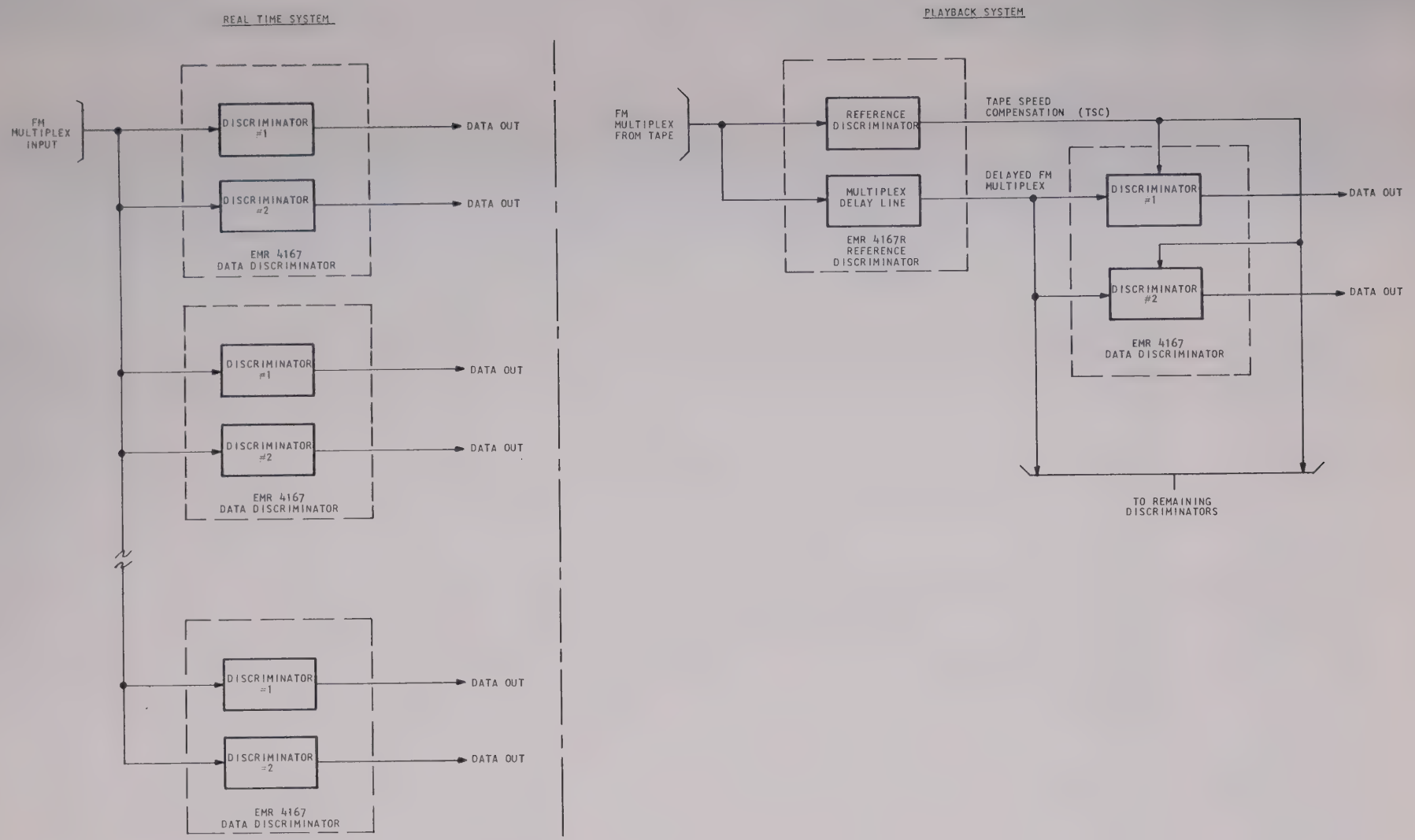


Figure 1-1. Typical System Configurations

Balance and bandedge volts controls are provided for each discriminator, as well as a deviation meter and IN/OUT test jacks. The balance control is used to set the unit output to zero with a center frequency input. The bandedge volts control is used to establish the maximum output voltage for full bandwidth deviation. The full-bandwidth output level is continuously adjustable from ±0.1V through ±10.5V.

A reference discriminator is the same as a data discriminator except that the deviation parameter is ±7.5% for all reference channels. The low-pass filter is a special configuration designed to amplitude complement the bandpass filter in the reference discriminator.

SECTION 2

SPECIFICATIONS

2.1 GENERAL

This section contains the electrical, mechanical, and environmental specifications for the EMR 4167. Also provided is model number identification which may be used to identify the unit parameters and capabilities. The model number is stamped on the nameplate attached to the side of the unit. Tables 2-1, 2-2, and 2-3 contain tabular listings of the standard EMR and IRIG proportional bandwidth and constant bandwidth FM telemetry channels and standard systems.

2.2 ELECTRICAL SPECIFICATIONS

The electrical specifications apply to both discriminators in a dual unit. Also, the specifications apply specifically to standard ±7.5% deviation IRIG proportional bandwidth channels and a deviation ratio of 5.

a. Center Frequencies: 300 Hz to 300 kHz.

b. Deviations: ±2.5% to ±40% of center frequency.

c. Deviation Polarity: Positive sense.

d. Data Cutoff Frequencies: 5 Hz to 60 kHz.

e. Input Impedance: Not less than 100 kΩ, shunted by less than 75 pF.

f. Input Signal Range: 10 mV to 5V rms.

g. Amplitude Modulation Rejection: A 20 dB step of input amplitude anywhere in the input range causes a peak transient no greater than 1% of full bandwidth.

h. Tape-Speed Compensation: An improvement ratio of 26 dB for tape-speed variations up to ±3%.

i. Non-Linearity: Not greater than ±0.05% of full bandwidth, best straight line.

j. RMS Output Noise: Not greater than 10 mV rms.

k. Total Harmonic Distortion: Not more than 0.5%.

1. Output Zero Stability: The following specifications apply to a unit after a 30-minute warmup and apply only to units containing the original channel selector card.

   1. Time -- Output drift is not greater than ±0.05% of center frequency plus ±0.05% of full bandwidth for 8 hours at a constant temperature.

   2. Temperature: The temperature coefficient of zero drift is not more than ±0.005% of center frequency per °F.

m. Deviation Sensitivity Stability: The following specifications apply to a unit after a 30-minute warmup and apply only to units containing the original channel selector card.

   1. Time -- Not more than 0.1% change in 8 hours at a constant temperature.

   2. Temperature -- The temperature coefficient of change is not more than ±0.03% per °F.

n. Output Voltage: Continuously adjustable at a front-panel control from ±0.1V to ±10.5V for full bandwidth deviation.

o. Output Current: Up to 50 mA peak.

p. Loading: Any capacitive load up to 0.01 μF, provided the output current is not exceeded. Output cannot be damaged by a short circuit.

q. Data Response: Determined by the plug-in output filter. Output filters have either constant-amplitude or constant delay characteristics. Asymptotic rolloff beyond cutoff is 30 dB/octave.

r. Power Requirements: The 4167 operates directly from an EMR Model 4024 Power Supply. The power supply operates from various primary AC power sources and can drive up to 10 4167's (up to 20 channels). Power dissipation of a 4167 is less than 14 watts. Refer to the power supply instruction manual for detailed power requirements.

2.3 MECHANICAL SPECIFICATIONS

a. Panel Size: 5-1/4 inches (13.3 cm) high by one modular width (1-7/32 inches; 3.10 cm).

b. Overall Depth: 16-3/4 inches (42.5 cm), excluding front-panel projections.

c. Weight: Net, 1 pound 6 ounches (624 gm). Shipping, 4 pounds (1.82 kg).

d. Panel Finish: Gray (26492) semigloss baked enamel with black lettering is standard. Other paints and panel lettering combinations may be obtained on special order.

e. Mounting: The 4167 mounts in an EMR Model 4005 Rack Adapter and occupies one modular width of the rack adapter interior. Therefore, a single rack adapter can house an EMR 4024 Power Supply (four modular widths) and ten 4167's (up to 20 channels).

2.4 ENVIRONMENTAL SPECIFICATIONS

a. Temperature: Operating temperature is +10°C to +50°C. Storage temperature is -55°C to +85°C.

b. Relative Humidity: 5% to 95%.

c. Altitude: 0 to 10,000 feet.

2.5 MODEL NUMBER IDENTIFICATION

The 4167 contains a nameplate on the right side of the unit cover. This model number reflects all pertinent information for the unit as originally supplied by EMR. Digits of the model numbers for both a dual data discriminator and for the reference discriminator are described as follows:

a	b	c	d	e	f	g
4167 - XX -	XXX.XXX -	XXX.XX -	( ) -	XXXXX.X -	( ) -	XXX.XXX -

h	i	j	k	l	
XXX.XX -	( ) -	XXXXX.X -	( ) -	X	Dual Modular Subcarrier Discriminator

a. Design Sequence --

01: One discriminator

02: Two discriminators

b. Center frequency in 6-digit kHz.

c. Deviation in 5-digit kHz for CBW channels or 5-digit % for PBW channels.

d. K for CBW
% for PBW

e. Cutoff frequency in 6-digit kHz.

f. Output Filter Characteristic --
A: Constant amplitude
D: Constant delay

g. Same as (b) except for discriminator #2.

h. Same as (c) except for discriminator #2.

i. Same as (d) except for discriminator #2.

j. Same as (e) except for discriminator #2.

k. Same as (f) except for discriminator #2.

l. Panel Paint and Lettering --
4: Gray, 26492, with black lettering
9: Special

a b c
4167-R X -XXX.XXX -X Reference Discriminator

a. Design Sequence --
1: Standard

b. Reference frequency in 6-digit kHz.

c. Panel Paint and Lettering --
4: Gray, 26492, with black lettering
9: Special

Channel selectors and low-pass filters have individual model numbers and may be obtained separately. These model numbers are as follows:

a b c d

4167-B[X]-[XXX.XXX]-[XXX.XX]-[ ] Channel Selector

a. Design Sequence --

1: Standard

b. Center frequency in 6-digit kHz.

c. Deviation in 5-digit kHz for CBW or 5-digit % for PBW.

d. K for CBW

% for PBW

a b c

4167-C[X]-[XXXXX.X]-[X] Output Filter

a. Design Sequence --

1: Standard

b. Cutoff frequency in 6-digit Hz.

c. Characteristic --

A: Constant amplitude

D: Constant delay

Table 2-1. IRIG Proportional-Bandwidth FM Telemetry Channels

IRIG Channel Number	Channel Center Freq. (Hz)	Deviation	Low Band Edge (Hz)	High Band Edge (Hz)	Data Cutoff Freq. (Hz)
1	400	±7.5%	370	430	6
2	560	±7.5%	518	602	8
3	730	±7.5%	675	785	11
4	960	±7.5%	888	1032	14
5	1300	±7.5%	1202	1398	20
6	1700	±7.5%	1572	1828	25
7	2300	±7.5%	2127	2473	35
8	3000	±7.5%	2775	3225	45
9	3900	±7.5%	3607	4193	59
10	5400	±7.5%	4995	5805	81
11	7350	±7.5%	6799	7901	110
12	10,500	±7.5%	9712	11,288	160
13	14,500	±7.5%	13,412	15,588	220
14	22,000	±7.5%	20,350	23,650	330
15	30,000	±7.5%	27,750	32,250	450
16	40,000	±7.5%	37,000	43,000	600
17	52,500	±7.5%	48,562	56,438	790
18	70,000	±7.5%	64,750	75,250	1050
19	93,000	±7.5%	86,025	99,975	1395
20	124,000	±7.5%	114,700	133,300	1860
21	165,000	±7.5%	152,625	177,375	2475
A	22,000	±15%	18,700	25,300	660
B	30,000	±15%	25,500	34,500	900
C	40,000	±15%	34,000	46,000	1200
D	52,500	±15%	44,625	60,375	1600
E	70,000	±15%	59,500	80,500	2100
F	93,000	±15%	79,050	106,950	2790
G	124,000	±15%	105,400	142,600	3720
H	165,000	±15%	140,250	189,750	4950

Table 2-2. IRIG and EMR Constant-Bandwidth FM Telemetry Channels

-KHz Deviation		±2-KHz Deviation		±4-KHz Deviation		±8-KHz Deviation	
No.	Center Freq.(KHz)	IRIG Ch. No.	Center Freq.(KHz)	IRIG Ch. No.	Center Freq.(KHz)	IRIG Ch. No.	Center Freq.(KHz)
	8						
	12						
	16	1A	16				
	20						
	24	2A	24				
	28						
	32	3A	32	3B	32		
	36						
	40	4A	40				
	44						
	48	5A	48	5B	48		
	52						
	56	6A	56				
	60						
	64	7A	64	7B	64	7C	64
	68						
	72	8A	72				
	76						
	80	9A	80	9B	80		
	84						
	88	10A	88				
		11A	96	11B	96	11C	96
		12A	104				
		13A	112	13B	112		
	120	14A	120				
		15A	128	15B	128	15C	128
		16A	136				
		17A	144	17B	144		
		18A	152				
		19A	160	19B	160	19C	160
		20A	168				
		21A	176	21B	176		
				23B*	192	23C*	192
		Ref.	240	Ref.	240	Ref.	240

*Not IRIG-standard

Table 2-3. EMR 12-Channel Constant-Bandwidth Instrumentation Systems

EMR Channel Number	Subcarrier Frequency Deviation (KHz)					
	±1	±2	±4	±8	±16	±32
	Subcarrier Center Frequency (KHz)					
1	8	16	32	64	128	256
2	12	24	48	96	192	384
3	16	32	64	128	256	512*
4	20	40	80	160	320	640
5	24	48	96	192	384	768*
6	28	56	112	224	448	896
7	32	64	128	256	512	1024*
8	36	72	144	288	576	1152
9	40	80	160	320	640	1280*
10	44	88	176	352	704	1408
11	48	96	192	384	768	1536*
12	52	104	208	416	832	1664
Ref.	60	120	240	480	960	1920

*These frequencies, plus a 1792-KHz reference signal, can be used in a five-channel, ±64-KHz-deviation system.

SECTION 3

INSTALLATION AND OPERATION

3.1 INSTALLATION

The EMR 4167 is shipped completely assembled and is ready for mounting. The unit should be inspected immediately on its arrival and notice given to EMR-Telemetry of any claim that the product does not conform with the terms of the order.

The 4167 is a modular unit designed for mounting in an EMR Model 4005 Rack Adapter. The modular unit is positioned on T-rails on the bottom surface of the rack adapter interior and is inserted into the mounting location. A push-to-lock knob on the front panel is depressed securing the unit in the mounting location of the rack adapter. The unit rear connector J1 mates with a corresponding receptacle in the rack adapter interior completing the electrical connections.

Information illustrating the position of the 4167's in the rack adapter is contained in the EMR Model 4005 Rack Adapter Instruction Manual supplied with the equipment. The 4167 rear connector J1 and the external connections terminated at J1 are illustrated in Figure 3-1.

Circulating air for cooling of the 4167's in the rack adapter is provided by a blower mounted vertically on the rack adapter rear panel.

3.2 OPERATION

3.2.1 Operating Components

All operating components are shown and identified in Figure 3-2. Front panels of both the 4167 (dual data discriminator) and the 4167R (reference discriminator) are shown. Each type of front-panel component is listed and described in Table 3-1. The dual data discriminator front-panel components are divided into two completely separate and independent groups. Components on the left side (as viewed from the front) of the front panel are for discriminator #1. Conversely, components on the right side are for discriminator #2. The only common component is the front-panel GND test jack. Functionally, the components for each data discriminator and components for the reference discriminator perform the same operation. Therefore, only one of each component type is discussed in Table 3-1.

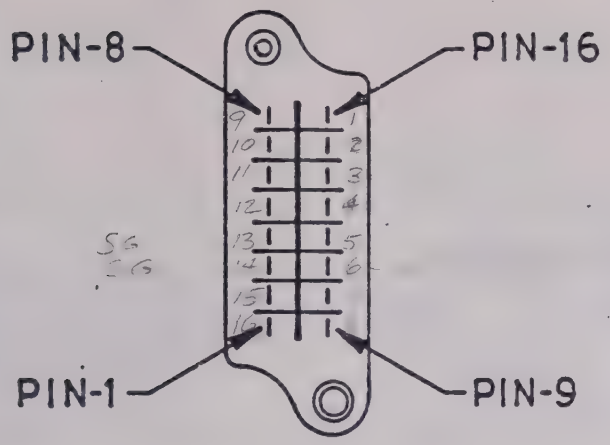
A front-panel tab identifies the operating parameters for the discriminators. For data discriminators, the center frequency, deviation, output filter cutoff frequency, and output filter response characteristic are identified. For reference discriminators, the reference frequency and the delay characteristics of the multiplex delay line are identified on the front-panel tab.

3.2.2 Operating Adjustments

The data discriminators operating adjustments consist of a balance setting and a bandedge volts setting. To perform these two adjustments, a precision frequency source should be connected to the multiplex input and a DC voltmeter should be connected to the data output. A balance adjustment is performed by supplying a center frequency input (1V rms) to the unit and adjusting the appropriate front-panel BAL control to obtain a 0V output. A bandedge volts adjustment is performed similarily by supplying a bandedge frequency input (1V rms) to the unit and adjusting the appropriate front-panel BEV control to obtain the desired bandedge volts. The bandedge output level may be set to any value from 0.1V to 10.5V peak.

The reference discriminator operating adjustments are performed in an identical manner as the data discriminators. However, the unit bandedge volts adjustment should be performed using a CF +3% input. The front-panel BEV control should then be set to obtain a +4V ±2 mV output level.

Connector J1 Layout



PIN	4167A	4167R
1	+18V Input	+18V Input
2	-18V Input	-18V Input
3	Signal Ground	Signal Ground
4	TSC #1 Input	- - -
5	TSC #2 Input	- - -
6	Signal Ground (OUTPUTS)	Signal Ground
7	Disc #2 Output	Ref. Disc Output (TSC Out)
8	Switch Output to Meter	Switch Output to Meter
9	Chassis Ground	Chassis Ground
10	- - -	- - -
11	- - -	- - -
12	Disc #1 Input	Multiplex Input to Delay Line
13	Signal Ground (INPUTS)	Signal Ground
14	Signal Ground (INPUTS)	Signal Ground
15	Disc #2 Input	Ref. Disc Input
16	Disc #1 Output	Multiplex Output from Delay Line

Figure 3-1. EMR 4167 Rear Connector and External Connections

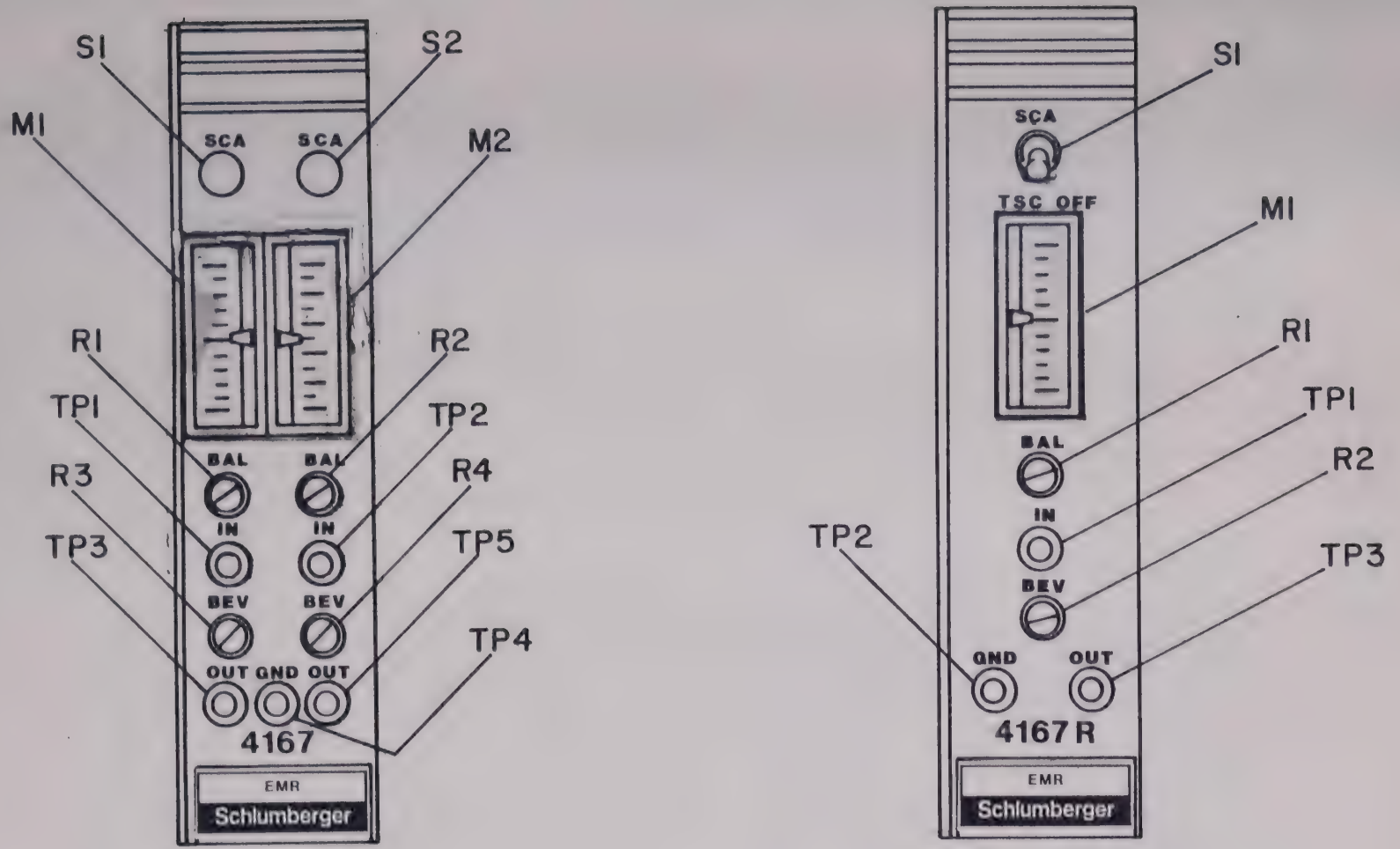


Figure 3-2. EMR 4167 Front Panel Layouts

Table 3-1. EMR 4167 Front-Panel Components Description
(Ref. Figure 3-2)

NAME	TYPE	FUNCTION
SCA Switch	Momentary Pushbutton Switch (or Toggle Switch)	When depressed, the subcarrier signal from the bandpass input filter output is routed to a front-panel amplitude meter on the associated EMR 4024 Power Supply. A single meter can, therefore, be used to display the amplitude of the subcarrier signal from any discriminator in a system. On a reference discriminator (4167R), this switch is used also as the TSC ON/OFF control. In this application, the switch is a center TSC ON and down TSC OFF toggle switch. The up position is a momentary selection used to display the reference frequency level on the power supply (the TSC remains on when the switch is in the up position).
Deviation Meter	- - -	This meter displays the amount of deviation occurring in the subcarrier channel. Center scale is 0 which corresponds to center frequency. Meter extremes (up and down) are identified as H (high bandedge) and L (low bandedge).
BAL Control	Potentiometer	Used to set the discriminator output voltage with a center frequency input.
IN Test Jack	- - -	Subcarrier signal monitor at the bandpass filter output.
BEV Control	Potentiometer	Used to set the discriminator output voltage with a bandedge frequency input.
OUT Test Jack	- - -	Data output monitor.
GND Test Jack	- - -	Ground.

SECTION 4

THEORY OF OPERATION

4.1 GENERAL

This section contains the general and detailed theory of operation for the EMR 4167. An overall functional description of the 4167 and typical system configurations descriptions are provided in Section 1 of this manual. The general theory of operation is provided in paragraph 4.2 with reference to the overall block diagram. The detailed theory discussion is provided in paragraph 4.3 with reference to the unit schematic and wiring diagrams. Remaining diagrams are provided in Section 5 of this manual.

4.2 GENERAL THEORY OF OPERATION

Primary circuits of each data discriminator in the 4167 are shown in the simplified block diagram, Figure 4-1. This block diagram also illustrates the circuits of a reference discriminator in a 4167R except that the TSC input is not used in a reference discriminator configuration.

The FM subcarrier multiplex input is routed from the unit input to an input buffer which supplies the FM multiplex to the bandpass input filter (BPIF). This filter is tuned to extract only the frequencies of a specific subcarrier channel from the FM multiplex. The subcarrier output of the BPIF is routed to a limiter circuit and to a front-panel SCA (subcarrier amplitude) switch. When the SCA switch is depressed, the subcarrier signal is coupled to the unit output for routing to a meter on the associated power supply.

The limiter circuit is a high-gain squaring circuit which converts the subcarrier signal into a square wave operating at the subcarrier rate. Zero crossings of the subcarrier signal are maintained, thus maintaining the modulation component of the subcarrier signal input. Both phases of the squared subcarrier signal are routed to the FM detector.

The FM detector is a pulse-averaging circuit which generates fixed-period pulses based on the subcarrier input. Spacing between the pulses is dependent on the zero crossings of the subcarrier signal. Therefore, the deviation is expressed as the average power in the pulse train. A current switch is operated at the FM detector output which converts the voltage pulses into current pulses. The front-panel BAL (balance) control operates in conjunction with the current switch to adjust the current with a center frequency input, thus balancing the FM detector.

A five-pole low-pass filter (LPOF) is supplied in data discriminators, while a three-pole LPOF is included in a reference discriminator. The LPOF is tuned for a particular cutoff frequency and response characteristic. The filtered output of the LPOF is routed to the front-panel deviation meter and to the

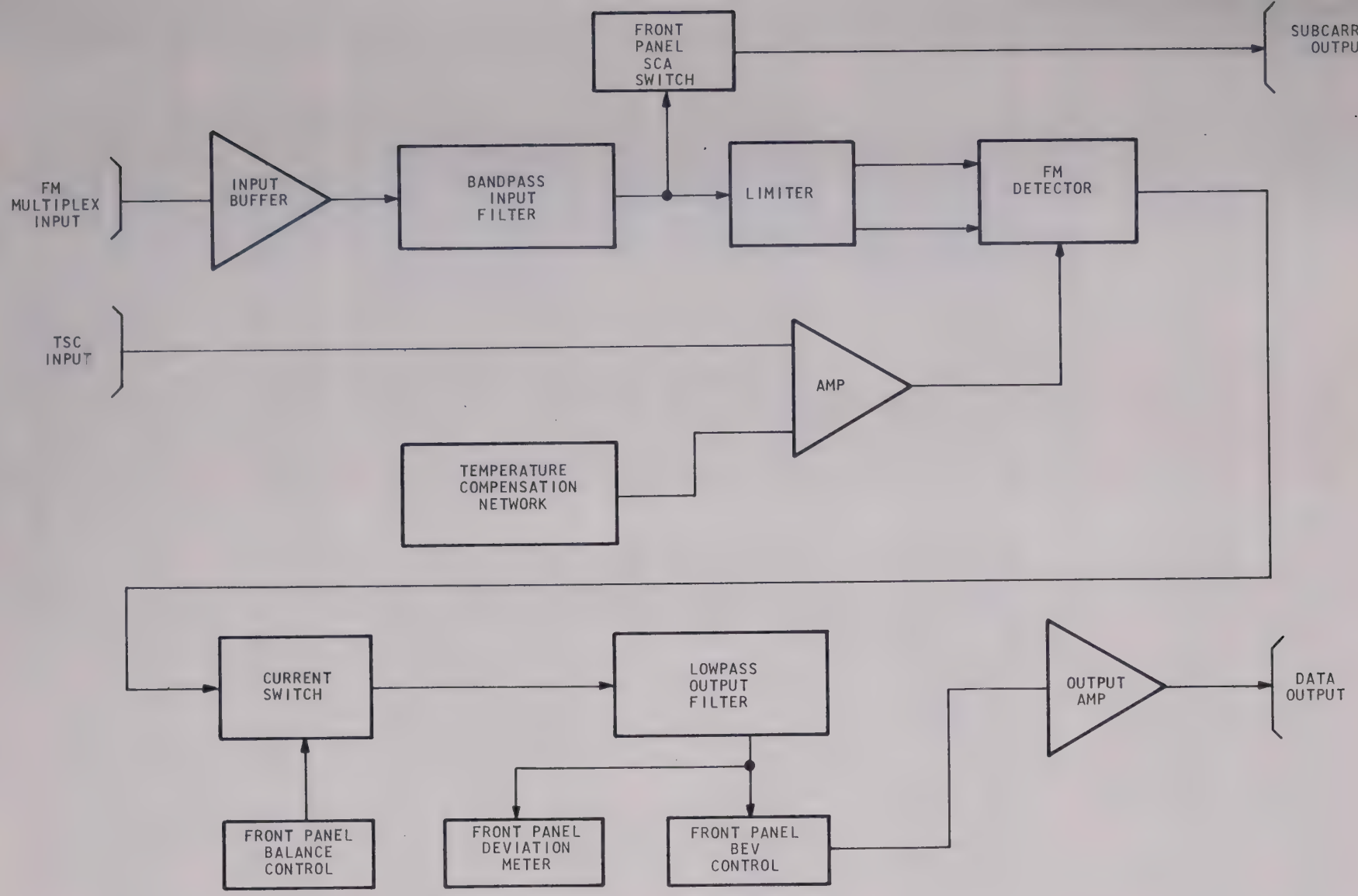


Figure 4-1. EMR 4167 Data Discriminator Block Diagram

front-panel BEV control. The meter displays the amount and direction of the deviation within the subcarrier channel. The output amplifier buffers the signal set at the BEV control and supplies the resulting signal to the unit data output.

The TSC and temperature compensation functions are combined in one network. TSC errors or errors resulting from temperature variations are thus removed or minimized by supplying proper compensation to the FM detector via this network.

4.3 DETAILED THEORY OF OPERATION

The detailed theory of operation is discussed with reference to the timing, schematic, and wiring diagrams in Figures 4-2 through 4-8. The discriminator card schematic diagram (Figure 4-3) illustrates the circuits for one discriminator. This schematic can, therefore, be used for either data discriminator in a 4167 data discriminator or for the reference discriminator in a 4167R reference discriminator.

The channel selector card schematic diagram (Figure 4-4) and the low-pass output filter card schematic diagram (Figure 4-5) may be used for any corresponding assembly in either a data discriminator or a reference discriminator. Figure 4-6 is the delay line card schematic diagram which applies to the delay line card installed only in a reference discriminator. Figures 4-7 and 4-8 are wiring diagrams for the two major 4167 equipments.

4.3.1 Discriminator Card Circuits (Ref. Figure 4-3)

The FM multiplex is routed via unit wiring to card terminal E1. A connection from E1 to jack J2 couples the FM multiplex to the channel selector card. Circuits on the channel selector are discussed in paragraph 4.3.2. The resulting subcarrier signal from the channel selector is routed back to the discriminator card via jack J5 and is supplied to the limiter circuit and to the front-panel SCA switch. When the SCA switch is depressed, the subcarrier signal is supplied at the unit output and is defined as the bandpass (BP) output. The signal may be routed via system wiring to an EMR 4024 Power Supply for display on the power supply meter.

The limiter circuit is a three-stage switching network which converts the subcarrier input to a square wave representation. Zero crossings of the subcarrier are maintained which maintains the modulation component of the subcarrier signal.

Transistor pair Q1A and B is the input stage connected in a differential configuration. Resistor R11 is a symmetry adjustment which is used to balance the current in both stages of Q1. The Q1B collector signal is coupled through two follower transistors Q2 and Q3 and through inverter Q4 to an output switching network consisting of transistors Q5-Q10. Diodes CR4 and CR5 limit the voltage swing at the Q5 input to approximately ±0.7 volt. The switching network

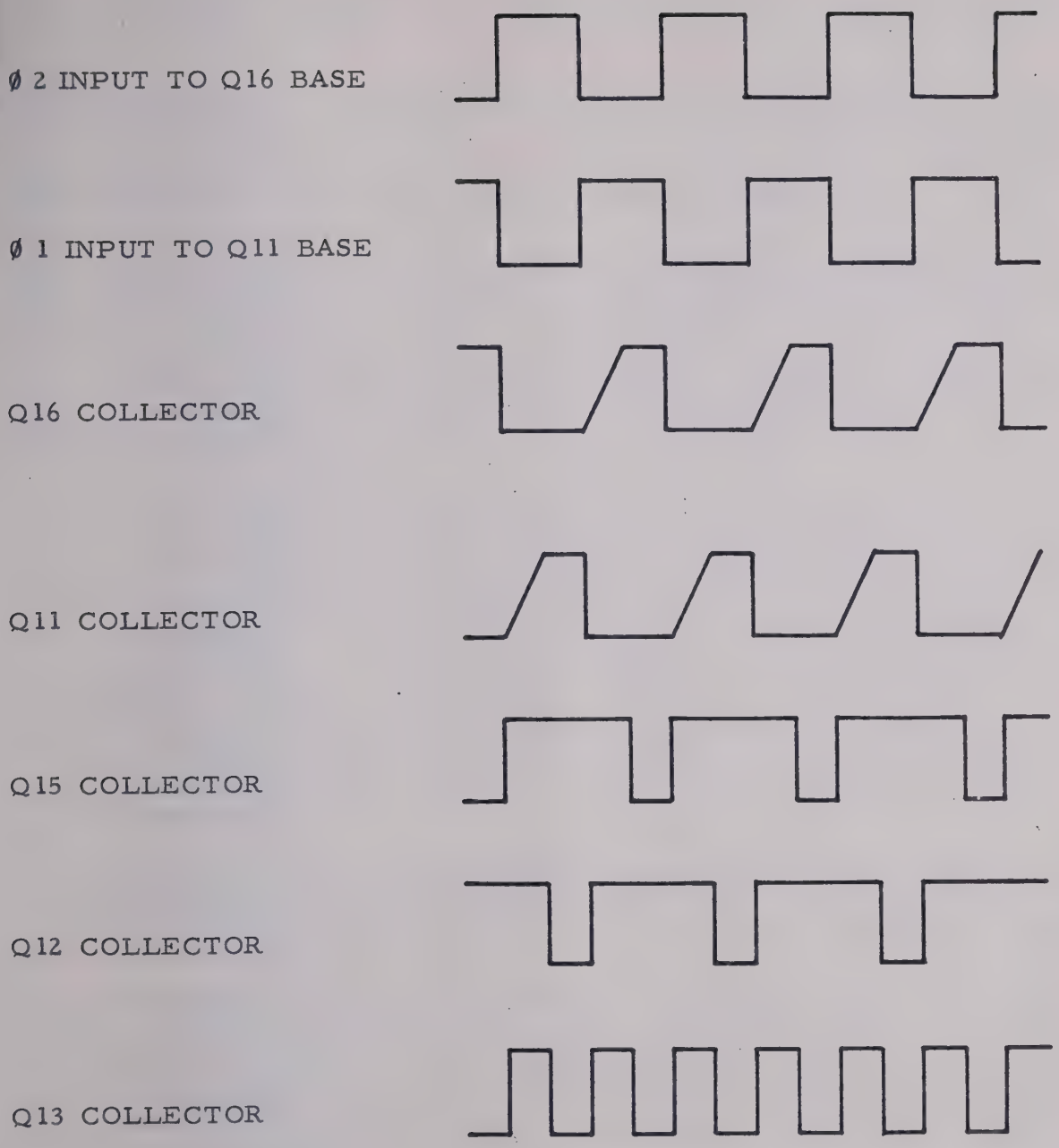


Figure 4-2. FM Detector Waveforms

(Q5-Q10) is a high-gain circuit which provides two square-wave outputs, 180° out-of-phase, representative of the subcarrier input. The outputs, identified as Ø 1 out and Ø 2 out, are coupled directly to the FM detector inputs.

The FM detector is a timing circuit which consists of two quarter-wave detectors, each operating from a Ø input. Transistors Q11 and Q16 are switching transistors operated by the Ø 1 and Ø 2 inputs. A timing diagram illustrating typical signals within the timing circuit is shown in Figure 4-2.

The Ø 2 input saturates Q16 during the positive half-cycle and capacitor C14 on the channel selector card is shorted. After termination of the positive half-cycle, Q16 is turned off and C14 starts charging toward the source voltage. As the charge increases to a specific level, Q15 is turned on and the C14 charge is terminated. Q15 remains on until the next positive half-cycle in which Q16 is again saturated and Q15 is turned off. Thus, Q15 is off until C14 charges (during the negative half-cycle) to a sufficient level again.

As a result, the period between positive half-cycles varies with the subcarrier rate but the charge time of C14 does not vary. The waveforms in Figure 4-2 illustrate the transistor switching and capacitor charging. The Ø 1 input to Q11 results in an identical switching operation with Q12. Both the Q12 and Q15 collectors are wire-OR'ed at the Q13 base which results in producing OR'ed pulses at the Q13 collector. Pulses at the Q13 collector at center frequency will have similar pulse durations; but at bandedge frequencies, the negative pulse durations will vary. As the subcarrier frequency increases, the negative pulse duration is shorter than the positive pulse duration. Conversely, as the subcarrier frequency decreases, the negative pulse duration is longer than the positive pulse duration.

Tuning of the two quarter-wave detectors is performed by fixed value capacitors (C12 and C14) installed on the channel selector card. These capacitors are sized for the appropriate center frequency as set by the channel selector card.

A current switch (Q17 and Q18) is operated at the timing circuit output which converts the voltage pulses to current pulses. Constant current source Q19/Q20 operates in conjunction with the front-panel BAL control to supply current for the current switch. The current switch output is routed directly to the LPOF which removes all high frequency components from the detected signal leaving only the modulation component.

A five-pole LPOF is included in a data discriminator, while a three-pole LPOF is included in a reference discriminator. Passive components which vary depending upon the LPOF cutoff frequency and response characteristic are installed on the LPOF card. Remaining components which do not vary and the active stages (U4-U6) of the LPOF are installed on the discriminator card.

The LPOF output is connected directly across the front-panel BEV control and is also routed via potentiometer R46 to the front-panel deviation meter.

The output amplifier is a two-stage network consisting of integrated circuits U2 and U3. Gain of the amplifier is set at approximately −10.2 by the ratio of feedback resistor R48 (10.2K) to input resistor R51 (1K). The amplifier output is set by the signal level selected at the front-panel BEV control. This output is coupled from the amplifier to a front-panel test jack and to a terminal of rear connector J1.

Integrated-circuit amplifier U1 supplies a DC source voltage to the FM detector. Changing or modulating this voltage level results in corresponding changes at the detector output. A diode bridge is connected to one input of the U1 amplifier. As temperature variations occur, the U1 output is changed by the diode bridge such that normal component reactions to the temperature changes are cancelled.

The same principle is used for the TSC function. Any errors incurred by the recording or playback of a tape are reflected in the data channels and the reference channel. As the reference discriminator detects the tape-speed errors in the reference channel, a TSC signal is supplied to one input of U1. The U1 output is thus modulated by the TSC signal resulting in changes in the FM detector. Changes in the FM detector are in opposition to the tape-speed errors, thus cancelling most effects of the tape-speed errors.

4.3.2 Channel Selector Card Circuits (Ref. Figure 4-4)

The channel selector card contains an input buffer, a BPIF, and timing components associated with circuits on the discriminator card. The FM multiplex input to the discriminator is connected via card terminal P2 through the cascaded follower (Q1 and Q2) to the BPIF. The BPIF is configured to extract only the frequencies of a subcarrier channel; all other frequencies are rejected. The resulting subcarrier signal is coupled through card terminal P5 back to the discriminator card. All discriminator card circuits and operations are discussed in paragraph 4.3.1.

4.3.3 Low-Pass Filter Card Circuits (Ref. Figure 4-5)

The low-pass filter card contains passive components which are used to establish the cutoff frequency and response characteristic of the LPOF. These passive components are connected with the active stages on the discriminator card to properly configure the LPOF. Data discriminators contain a five-pole filter, while reference discriminators contain a three-pole filter. The circuit configuration change between these two filters is defined in the NOTES of Figure 4-5.

The data discriminator LPOF has an asymptotic rolloff of 30 dB/octave beyond the cutoff frequency. Response of the LPOF is either constant amplitude (CA) or constant delay (CD). The reference discriminator LPOF is designed specifically to amplitude complement the BPIF so that the total response of the discriminator is constant through the reference channel.

4.3.4 Delay Line Card Circuits (Ref. Figure 4-6)

This card is installed on the discriminator card in a reference discriminator only. Included on the card is an input buffer (Q1/Q2), a series delay network, and an output buffer (Q3/Q4). The FM multiplex is first coupled to card terminal P2 from the discriminator card. Components of the delay line are variable and are established by the amount of delay required for the FM multiplex. This delay is a function of the delay through the reference discriminator. The delay is set such that the FM multiplex and the TSC signal at the reference discriminator outputs are time-coincident.

The delayed FM multiplex from the signal delay components is coupled through the output buffer to card terminal P29. This terminal routes the signal to the discriminator card terminal E11 which is then connected to the unit output at the rear connector J1.

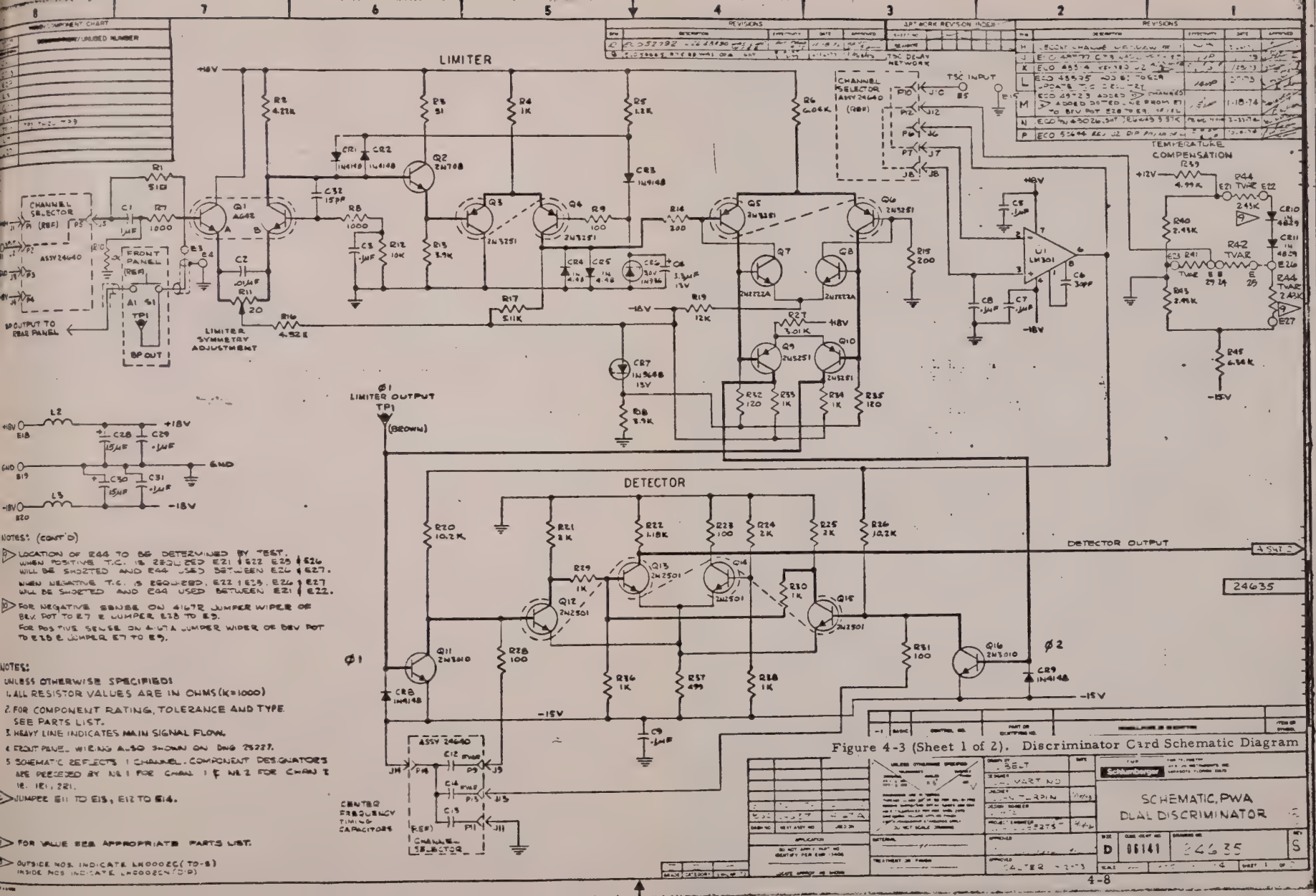


Figure 4-3 (Sheet 1 of 2). Discriminator Card Schematic Diagram

SCHEMATIC, PWA
DUAL DISCRIMINATOR

D 06141 24635

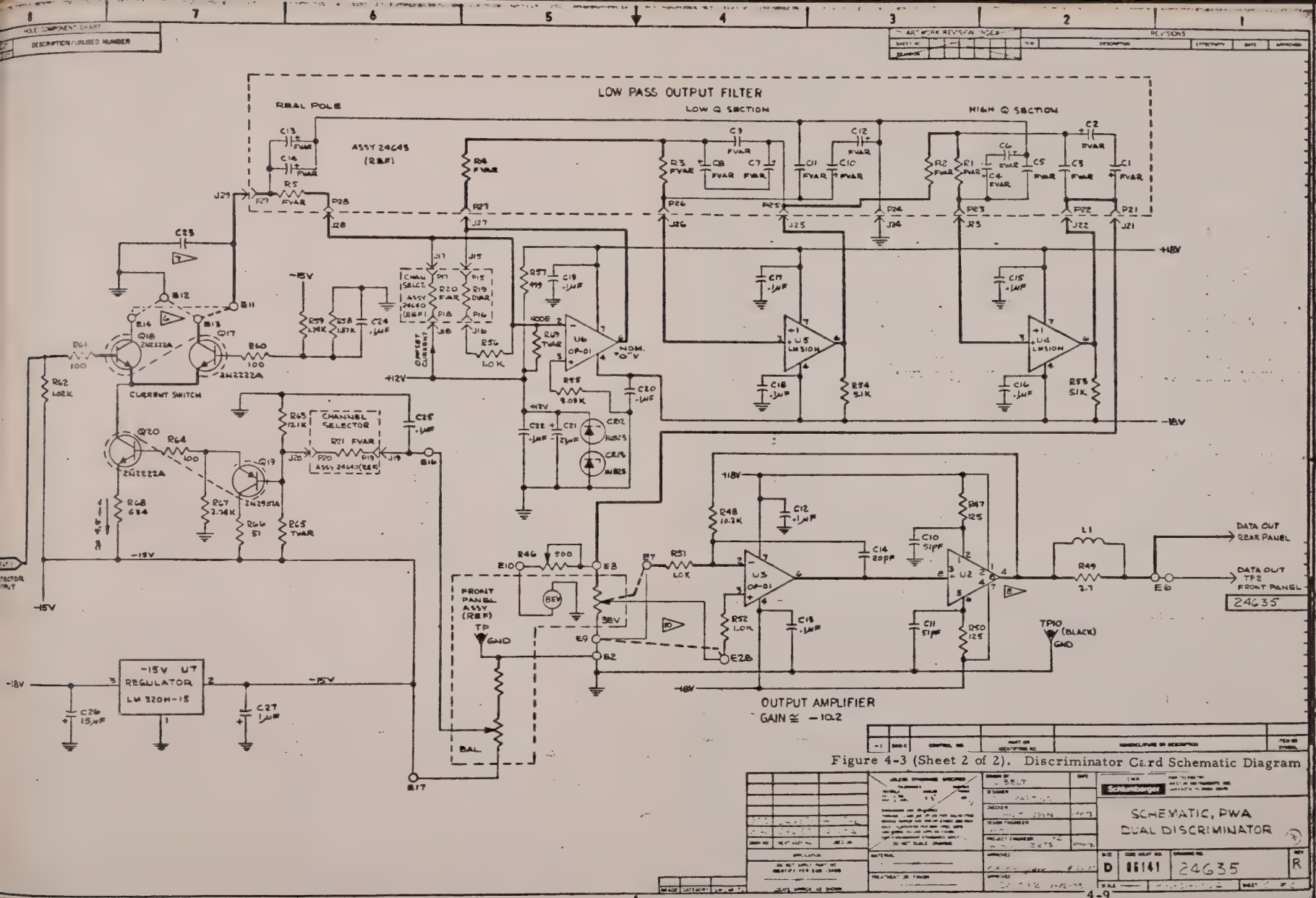
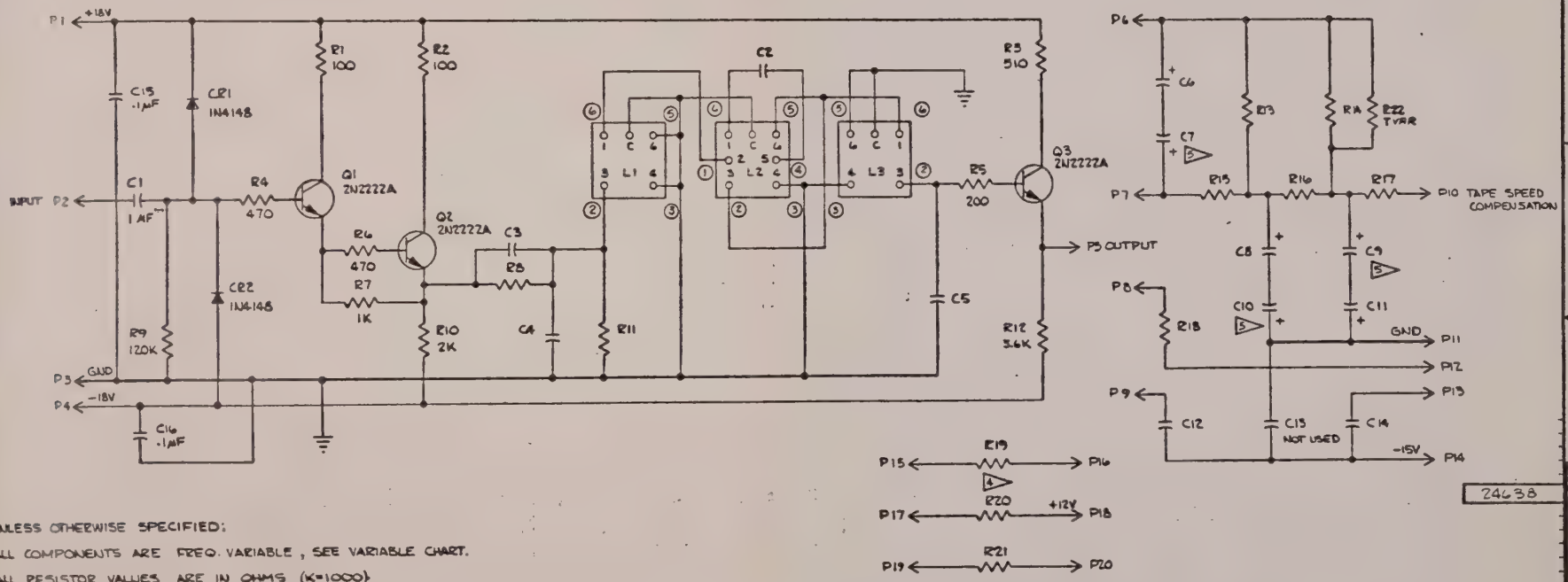


Figure 4-3 (Sheet 2 of 2). Discriminator Card Schematic Diagram

SCHEMATIC, PWA
DUAL DISCRIMINATOR

D | 16141 | 24635 | R



24638

NOTES:

UNLESS OTHERWISE SPECIFIED:

1. ALL COMPONENTS ARE FREQ. VARIABLE, SEE VARIABLE CHART.
2. ALL RESISTOR VALUES ARE IN OHMS (K=1000)
3. FOR TYPES, TOLERANCE AND RATINGS SEE PARTS LIST.

△4 DEVIATION VARIABLE. SEE VARIABLE CHART.

△5 C7, C9 AND C10 ARE USED FOR FREQUENCIES 7.5 Hz THRU 75 Hz.
C7, C9 AND C10 ARE SHORTED FOR FREQUENCIES FROM 75 Hz THRU 120 KHz.

6. NO'S IN CIRCLES AROUND INDUCTORS ARE ALTERNATE PIN NO'S.

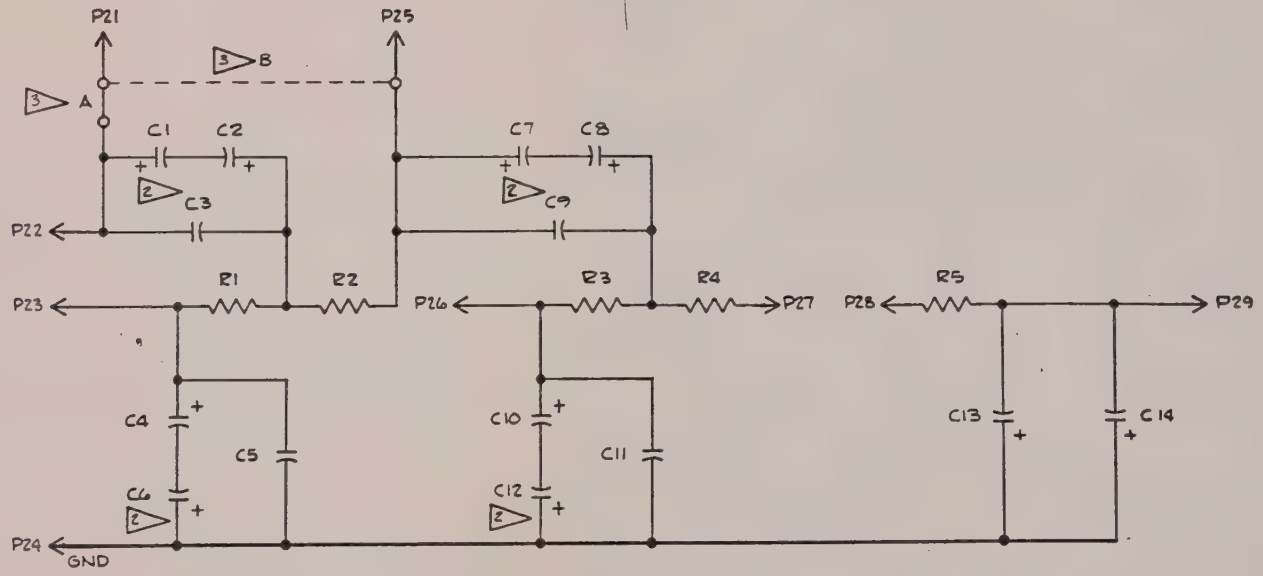
Figure 4-4. Channel Selector Card Schematic Diagram

SCHEMATIC, P/N A
CHANNEL SELECTOR

D 86141 24638 A

COMPONENT CHART	
LAST NO. USED	UNUSED NUMBER
C14	
R5	
P29	P1 THRU P20

REVISIONS				
SYM	DESCRIPTION	EFFECTIVITY	DATE	APPROVED



24641

NOTES:

UNLESS OTHERWISE SPECIFIED:

1. ALL COMPONENTS ARE FREQ. VARIABLE. SEE VARIABLE CHART.

2 C1, C6, C7 AND C12 ARE USED FOR FREQUENCIES 5Hz THRU 50 Hz. C1, C6, C7 AND C12 ARE SHORTED FOR FREQUENCIES FROM 50Hz. THRU 60 KHz.

3 CONNECTION "A" USED FOR NORMAL OPERATION. FOR REFERENCE, BREAK CONNECTION "A", MAKE CONNECTION "B".

Figure 4-5. Low-Pass Output Filter Card Schematic Diagram

-2	-1	BASIC	DWG SIZE	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	CODE IDENT	ITEM OR SYMBOL
REQUIRED					PARTS LIST		

UNLESS OTHERWISE SPECIFIED
TOLERANCES
DECIMALS ANGLES SURFACES
XX ± .02 FINISH
XXX ± .010 ± P
DIMENSIONS ARE IN INCHES
THREADS CLASS 3A OR 2B PER MIL-S-7742
REMOVE BURRS AND BREAK EDGES .010 MAX.
HOLE TOLERANCES PER EMR SPEC 2573
DIMENSIONS INCLUDE APPLIED FINISH
DO NOT SCALE DRAWING

DRAWN BY: Sai Wattenburg — DATE: 1-3-73
DESIGNER: E. Mathews — 1-3-73
CHECKER: T. Brian — 1/8/73
DESIGN ENGINEER:
PROJECT ENGINEER: — 1/8/73
APPROVED: T Rebrad — 4/13/73
APPROVED: — 1/3/73

EMR TELEMETRY / EMR DIVISION OF WESTON INSTRUMENTS, INC. A SCHLUMBERGER COMPANY

SCHEMATIC, PWA L.P.O.F.

ESC	24641	-0506
DASH NO.	NEXT ASSY NO.	USED ON

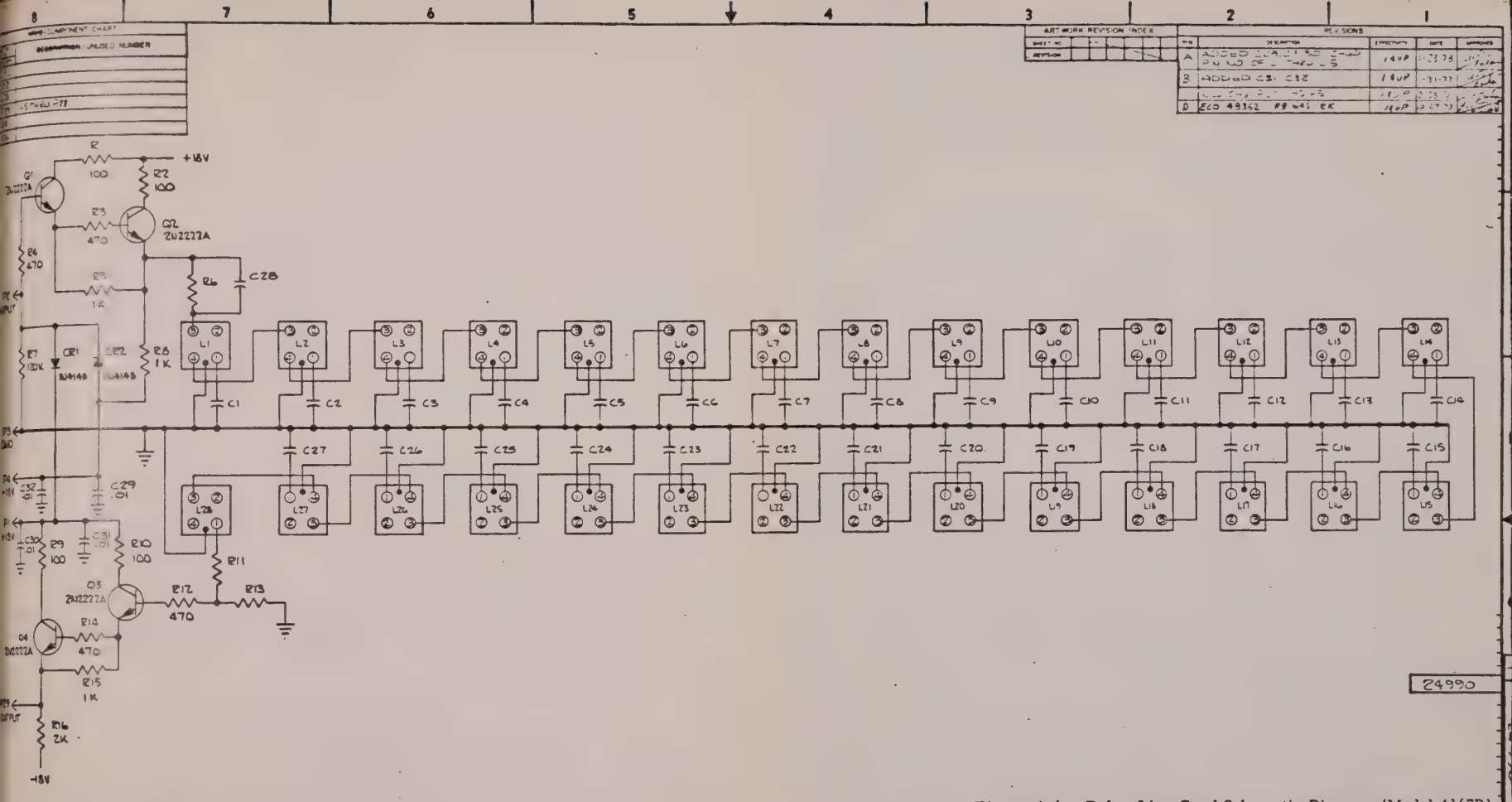
APPLICATION
DO NOT APPLY PART NO. PER
LOCATE APPROX AS SHOWN

MATERIAL
TREATMENT OR FINISH

SIZE	CODE IDENT NO.	DRAWING NO.	REV
C	06141	24641	
SCALE —	3515-10006	SHEET 1 OF 1	

II	II
GRADE	CATEGORY

EMR 2/2/MC



24990

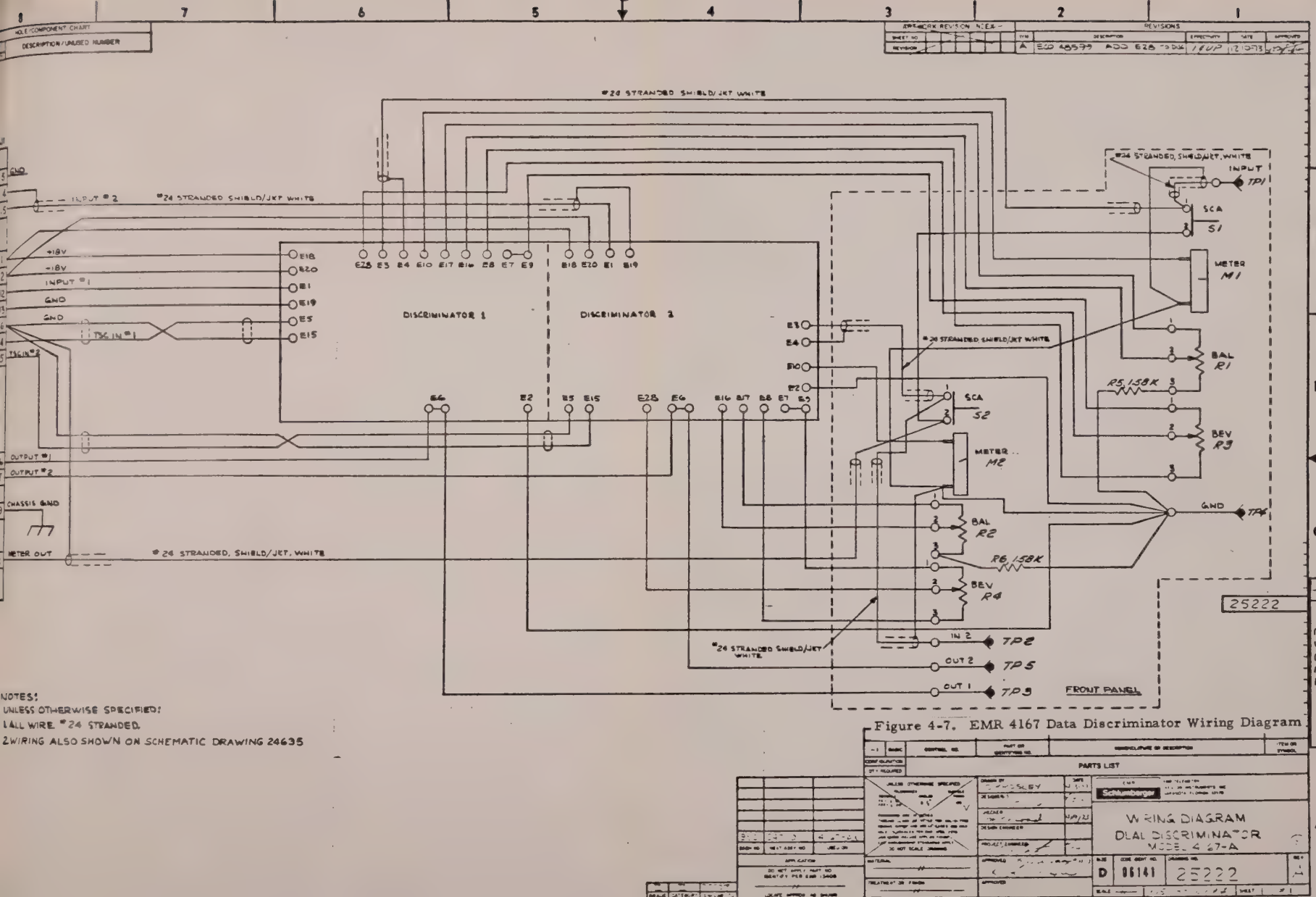
Figure 4-6. Delay Line Card Schematic Diagram (Model 4167R)

NOTES:
UNLESS OTHERWISE SPECIFIED:
1. ALL COMPONENTS ARE VARIABLE, SEE VARIABLE CHART.
2. ALL RESISTOR VALUES ARE IN OHMS (K=1000).
3. FOR RATINGS AND TOLERANCES, SEE PARTS LIST.
4. ALL CAPACITOR VALUES ARE IN μf.

PARTS LIST

SCHEMATIC, PWA
DELAY LINE

D 88141 24990 D



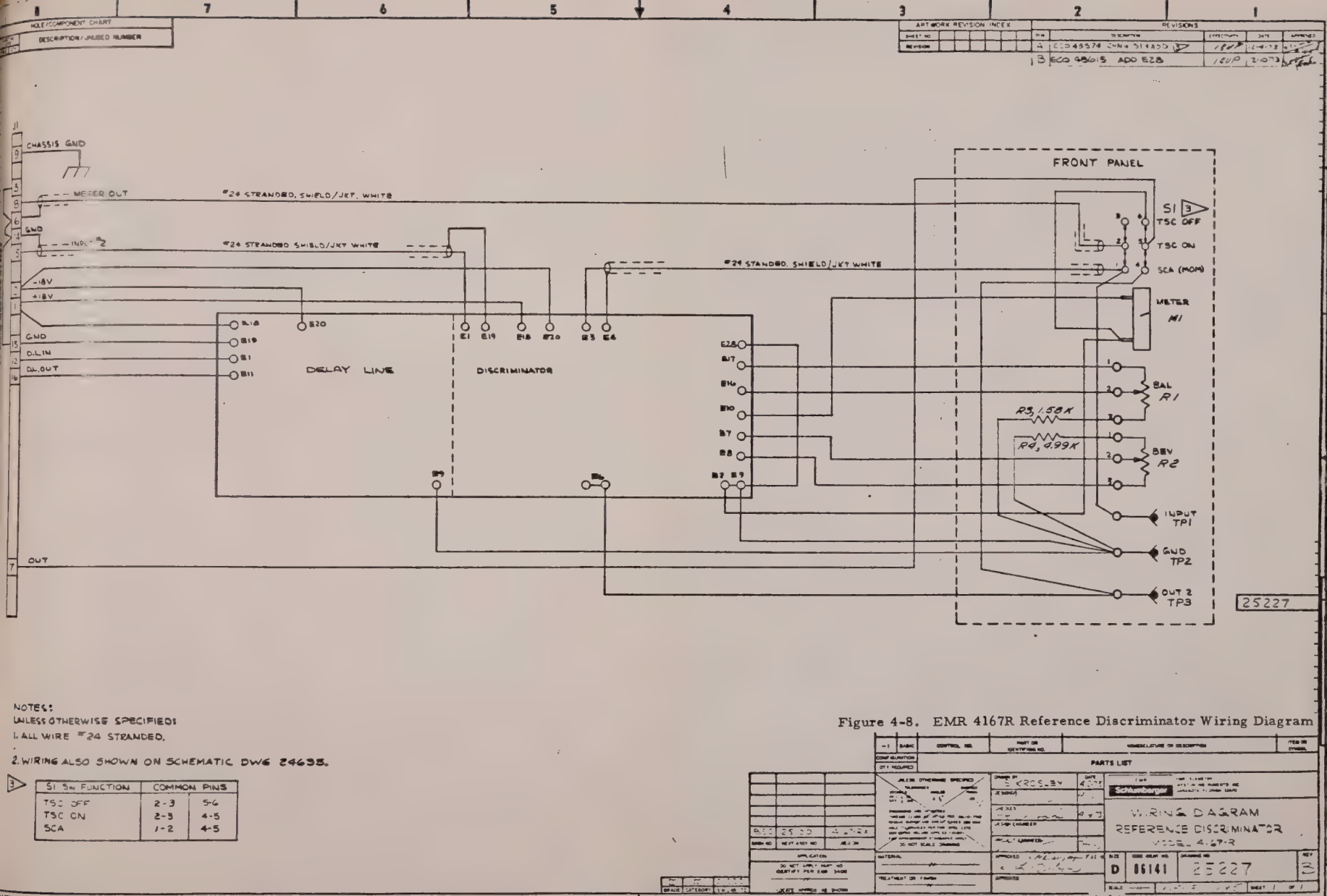
NOTES:
UNLESS OTHERWISE SPECIFIED:
1 ALL WIRE #24 STRANDED.
2 WIRING ALSO SHOWN ON SCHEMATIC DRAWING 24635

Figure 4-7. EMR 4167 Data Discriminator Wiring Diagram

PARTS LIST

WIRING DIAGRAM
DUAL DISCRIMINATOR
MODEL 4167-A

D 06141 25222



NOTES:
UNLESS OTHERWISE SPECIFIED:
1. ALL WIRE #24 STRANDED.
2. WIRING ALSO SHOWN ON SCHEMATIC DWG 24635.

S1 SW FUNCTION	COMMON PINS	
TSC OFF	2-3	5-6
TSC ON	2-3	4-5
SCA	1-2	4-5

Figure 4-8. EMR 4167R Reference Discriminator Wiring Diagram

SECTION 5

MAINTENANCE

5.1 GENERAL

This section contains general and detailed maintenance information for the EMR 4167. Included in this information is a routine maintenance guide (paragraph 5.2), troubleshooting procedures (paragraph 5.3), and adjustment procedures (paragraph 5.4). The mechanical assembly diagrams are discussed in paragraph 5.5 and are shown in Figures 5-1 through 5-8. All electrical diagrams (block, schematic, and wiring) are supplied in Section 4 along with the theory of operation.

5.2 ROUTINE MAINTENANCE

The EMR 4167 routine maintenance consists of a periodic inspection of the unit and associated equipments (rack adapter, power supply, etc.). An inspection should be performed periodically to locate potential problems or, if a malfunction occurs, to assist in isolating a trouble. The inspection schedule will vary depending on the equipment use and the environment and, therefore, should be established by maintenance personnel. Items which should be inspected are listed as follows:

a. Inspect all rack adapter rear-panel connections, internal wiring, and internal mating receptacles for the modular equipments.

b. Inspect all 4167 front-panel components for proper installation and operation.

c. Inspect the 4167 rear connector and connector terminals.

d. Remove the 4167 cover and inspect all printed-wiring cards. Check all cards components as well as the plug-jack connections between cards.

e. Inspect all 4167 wiring for loose or broken connections.

As a normal routine, the discriminators balance and bandedge volts adjustments should be checked. Information describing these operations is provided in Section 3 of this manual. Also, the power supply output voltages should be checked occasionally. This is performed at the power supply by referring to the power supply instruction manual or to paragraph 5.3.1 of this manual.

5.3 TROUBLESHOOTING

The EMR 4167 is a precision solid-state unit designed for long component life. However, should a malfunction occur, transistor or integrated-circuit module replacement will repair a majority of troubles.

Prior to troubleshooting in the 4167 circuits, the operator should be thoroughly familiar with the type and function of all 4167 circuits as discussed in Section 4 of this manual. A detailed block diagram is provided with the circuit discussions to assist in understanding the circuits. Detailed schematic diagrams of all cards are also supplied in Section 4 along with the unit wiring diagrams. Mechanical assembly diagrams in this section (paragraph 5.5) should be used in conjunction with the schematic diagrams to assist in locating specific components.

Once familiar with the unit circuits and the circuit functions, the operator can systematically trace signal flow or measure voltage levels to isolate a specific malfunction. Further aids in checking the unit and isolating malfunctions are provided in paragraphs 5.3.1 and 5.3.2.

After a malfunctioning component(s) is located, refer to the parts list in Section 6 of this manual for replacement component information. Readjustment of the affected circuit may be required after repair, depending on the particular component(s) replacement. This is determined primarily by the circuit location and the function of the replaced component(s). All adjustment information is provided in paragraph 5.4.

5.3.1 Power Supply Check

Before troubleshooting any 4167 circuits, check the power supply/regulator for proper outputs. The following guide should be used to check the power supply.

a. Remove the cover from the 4167 and extend the unit from the rack adapter using a test adapter (typically an EMR Model 4601-02).

b. Using a DC voltmeter, monitor discriminator card terminals E18 and E20 for +18 and −18 volts ± 100 millivolts, respectively. Ripple shall be less than 10 millivolts peak-to-peak.

c. If voltages are in error, troubleshoot the external power supply using the power supply instruction manual.

d. Using a DC voltmeter, monitor discriminator card terminal E17. The level should be −15 volts ± 300 millivolts.

e. If the voltage is in error, inspect the components and the card area around regulator integrated circuit U7. If no trouble can be located, circuit U7 should be replaced. Recheck the level after replacement of U7.

5.3.2 Circuit Waveforms

The circuit waveforms are designed to aid in isolating a malfunction to a functional circuit in the discriminator. These waveforms are shown in Table 5-1. Figure 4-1, detailed block diagram, should be used in conjunction with the discriminator waveform table since this diagram illustrates all functional circuits and prime signal flow in the unit.

The waveforms shown in Table 5-1 are typical for any discriminator configuration; however, when applying an input signal, the signal parameters must correspond to the parameters established by the plug-in units.

To check the waveforms, the following preliminary steps shall be taken:

a. Remove the cover from the 4167 and extend the unit from the rack adapter using a test adapter (typically an EMR Model 4601-02).

b. Obtain a subcarrier oscillator with operating parameters of the channel selector installed in the unit.

c. Supply a ground level potential to the tape-speed compensation (TSC) input of the discriminator (data discriminator only).

d. Apply a subcarrier signal to the 4167 input of 2 volts peak-to-peak at the center frequency of the subcarrier channel.

5.4 ADJUSTMENTS

This paragraph contains information describing all maintenance adjustments in the 4167. Most adjustments in the unit are operating adjustments which are discussed in Section 3 of this manual. Operating adjustments are performed at front-panel components, while maintenance adjustments are performed at components in the unit interior. To perform the maintenance adjustments, the cover must be removed from the unit enabling access to the internal assemblies. The unit must also be extended from the rack adapter using a test adapter (typically an EMR Model 4601-02). After the adjustments are complete, the unit should be re-assembled and re-installed appropriately.

There is no particular adjustment period requirements. The adjustments may be performed as desired to ensure continued accurate outputs. However, all adjustments are performed at EMR prior to shipment and normally no re-adjustment is required unless a malfunctioning component is replaced or after long operating periods.

Prior to performing the 4167 adjustments, the DC supply voltages from the associated EMR 4024 Power Supply should be checked for the proper output levels. Reference should be made to the EMR 4024 Power Supply Instruction Manual for the supply output requirements.

5.4.1 Symmetry Adjustment

Each discriminator circuit (data or reference) contains an identical limiter stage which contains a symmetry adjust potentiometer. The following adjustment procedure can, therefore, be used for adjustment of this function in any 4167.

a. Using an external signal generator, supply a 10 mV rms signal to the 4167 input at the center frequency of the subcarrier channel.

b. Using an oscilloscope, monitor discriminator card test jack TP1.

c. Switch the input level from the initial setting of 10 mV to 1V rms and observe the symmetry of the signal at TP1.

d. Adjust discriminator card potentiometer R11 until the signal symmetry remains constant regardless of the input level.

5.4.2 Bandedge Meter Zero Adjustment

All front-panel deviation meters zero adjustment is performed as follows:

a. After removing the unit cover, re-install the unit on the rack adapter T-rails and insert the unit just far enough to hold it in the normal operating plane.

b. Using a non-metallic tool, adjust the meter zero adjust control to center the meter needle on the 0 position of the dial.

5.4.3 Bandedge Meter Sensitivity Adjustment

All front-panel deviation meters sensitivity adjustment is performed as follows:

a. Using a signal generator, supply an upper bandedge signal of 2 volts peak-to-peak to the unit input.

b. Adjust potentiometer R46 on the discriminator card to the point at which the meter needle indicates full scale (upper bandedge) on the meter dial.

5.5 ASSEMBLY DIAGRAMS

The assembly diagrams for the 4167 are provided in Figures 5-1 through 5-8. Figure 5-1 is the unit top assembly diagram, while remaining figures illustrate

subassemblies and cards of the unit. Components or items of an assembly are identified on the assembly diagrams by reference numbers in balloons or by reference designators adjacent the components. These reference numbers or designations correspond to identical numbers in the parts list tables of Section 6.

Table 5-1. EMR 4167 Circuit Waveforms

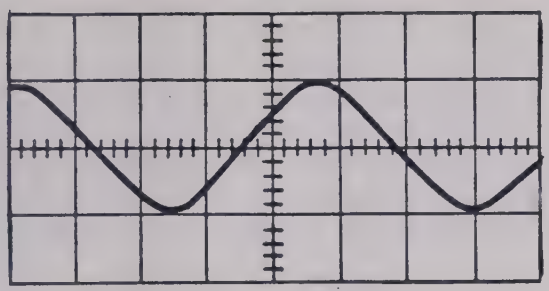
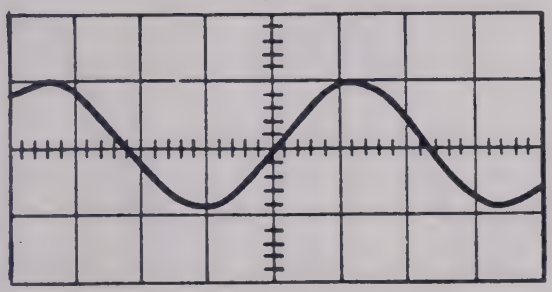
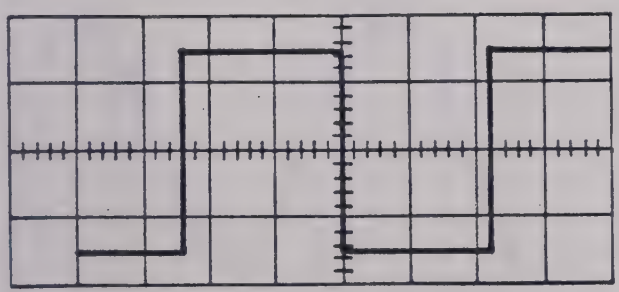
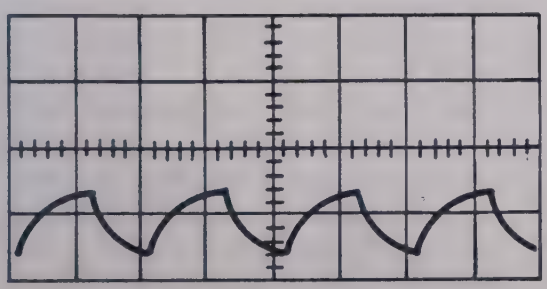
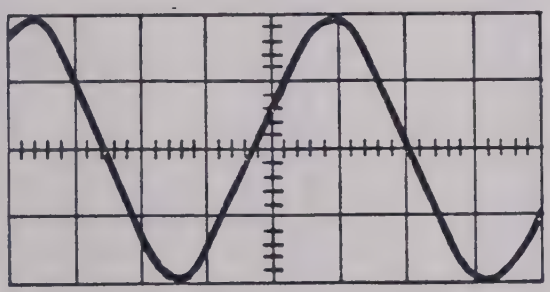
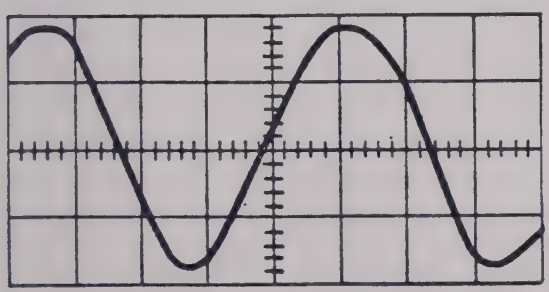
CIRCUIT LOCATION	INPUT	WAVEFORM	OSCILLOSCOPE	
			VERT.	HORIZ.
Center frequency subcarrier input at rear connector J1 pin 12 or 15.	2 volts peak-to-peak	(1) 	1V/cm	---
Front-panel test jack TP1.	2 volts peak-to-peak	(2) 	1V/cm	---
Limiter output at TP1.	1.4 volts peak-to-peak	(3) 	.5V/cm -15	---
Current switch output at E11.	2 volts peak-to-peak	(4)  0 -9	5V/cm	---

Table 5-1 (Cont'd.). EMR 4167 Circuit Waveforms

CIRCUIT LOCATION	INPUT	WAVEFORM	OSCILLOSCOPE	
			VERT.	HORIZ.
		NOTE For the remaining waveforms, modulate the subcarrier signal input to the unit using a data signal of approximately 1/10 the cutoff frequency of the low-pass filter installed in the unit. The modulating data signal should deviate the subcarrier signal input from bandedge-to-bandedge.		
Low-pass output filter (LPOF) output at E8.	2 volts peak-to-peak with full-scale data modulation.	(5) 	.5V/cm	---
Data output at front-panel OUT test jack.	20 volts peak-to-peak with full-scale data modulation.	(6)  (Adjust front-panel B.E. VOLTS control to ascertain that an output amplitude of approximately 20 volts peak-to-peak can be obtained. This applies to data discriminators only. Reference discriminators can be adjusted such that the output is variable from 19 V peak-to-peak to 21V peak-to-peak.)	5V/cm	---

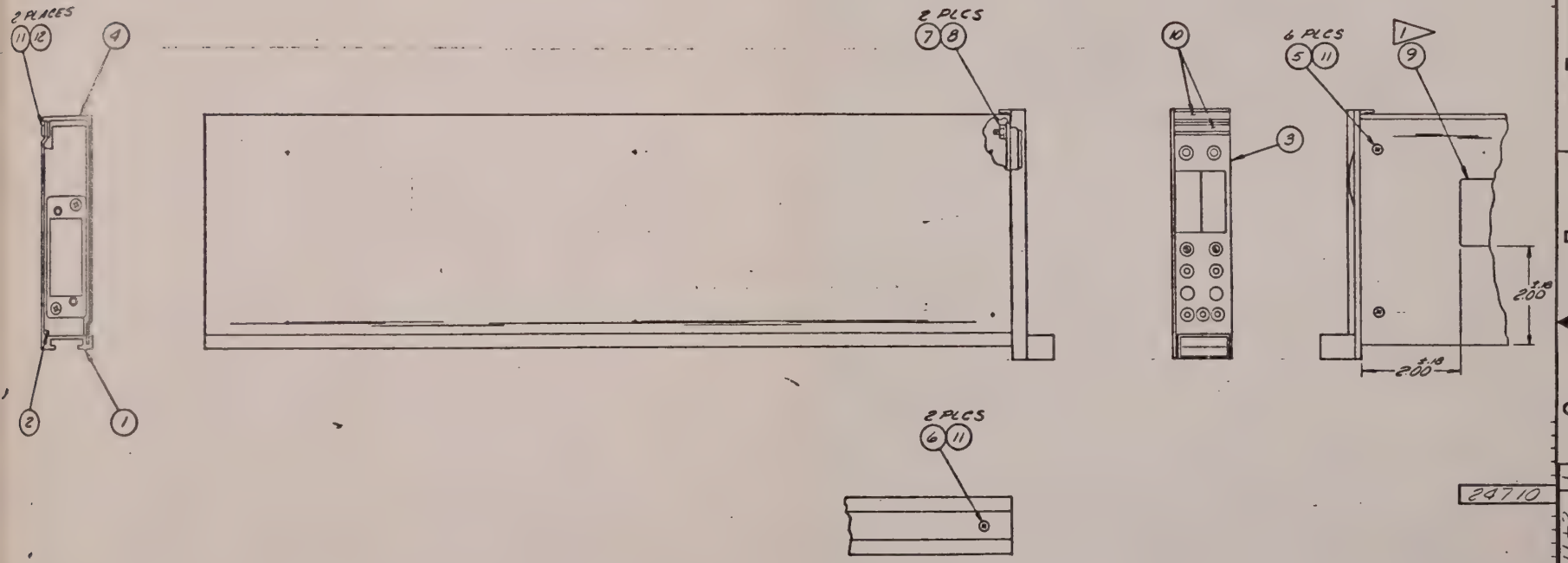


Figure 5-1. EMR 4167 Data Discriminator Top Assembly Diagram

-2	089-89-00071		FOR PARTS LIST SEE PL-24710-2
-1	089-89-00070		FOR PARTS LIST SEE PL-24710-1
BSC			- 2 PARTS LIST SEE PL-24710

PARTS LIST

-2	FINAL	4167-A1
-1	FINAL	4167-01

APPLY APPLICABLE INFO PER EMR 13406

DISCRIMINATOR ASSEMBLY
DUAL MODULAR
CUSTOMER

D 86141 24710

NOTES:

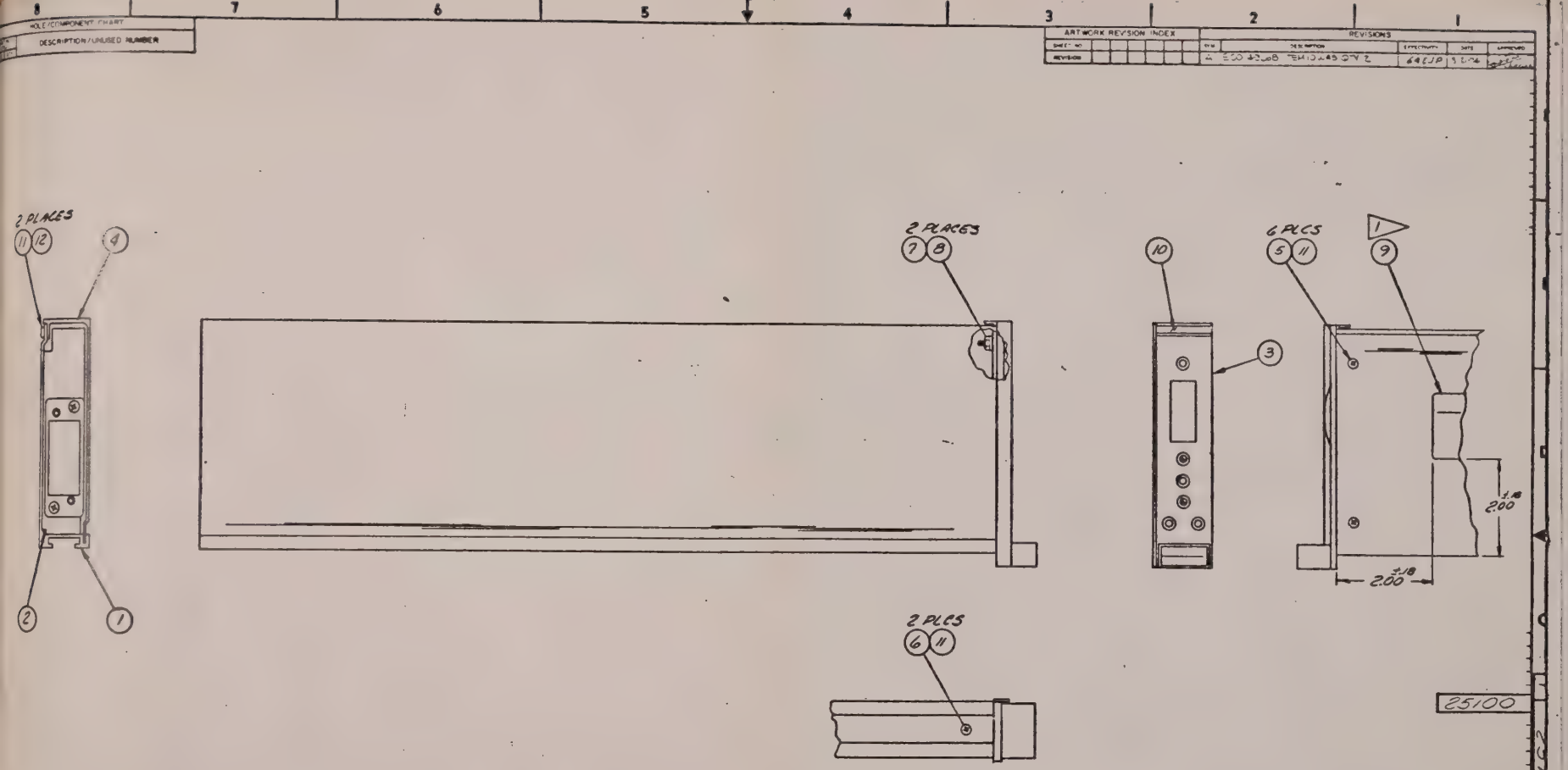
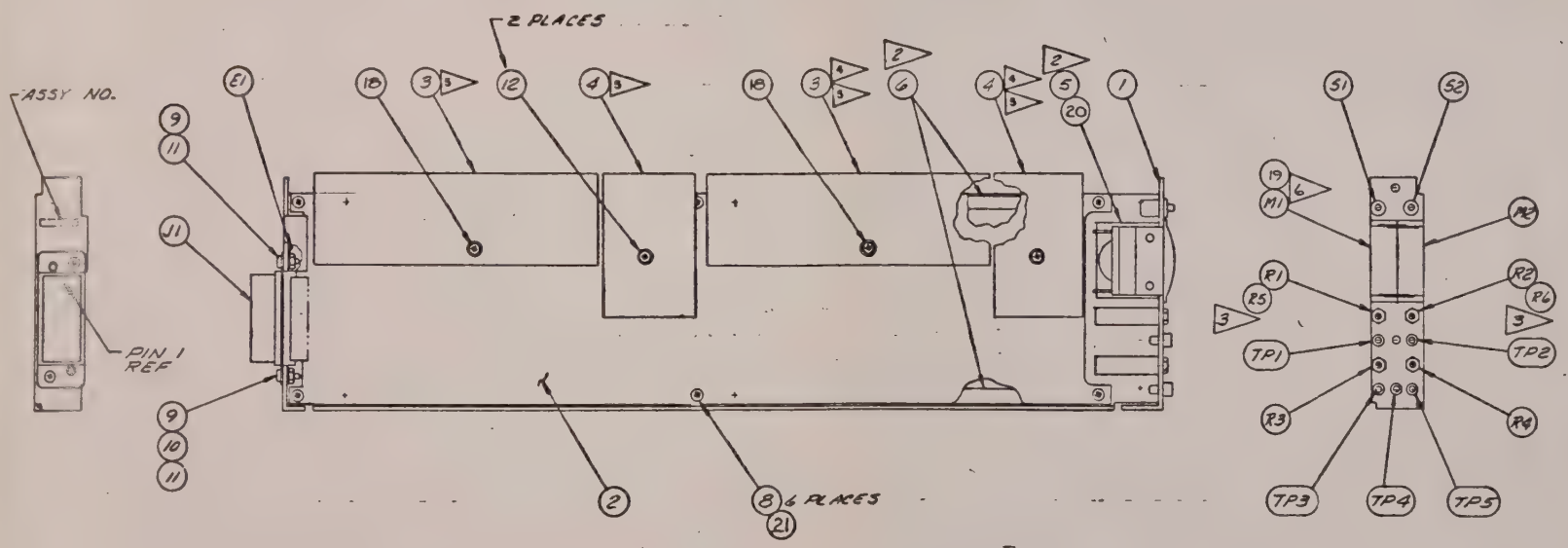


Figure 5-2. EMR 4167R Reference Discriminator Top Assembly Diagram

APPLY APPLICABLE INFO PER EMR 19406

NOTES:



24709

6 ADD ITEM 19, GLASS CLOTH TAPE, TO ONE SIDE AND TWO EDGES OF M1 PER DETAIL "A". TAPE TO BE FLUSH WITH BACK EDGE OF METER & MUST NOT PROTRUDE AROUND THE FAR SIDE.

5 NOT USED ON -2 CONFIG.

4 NOT USED ON -1 CONFIG.

3 INSTALL R5 & R6 (RESISTORS) PER WIRING DIAGRAM 25222

2 ITEM 5 (INSUL) IS INSTALLED BETWEEN M1 & M2, BONDED TO M2 USING ITEM 20. ITEM 6 (INSUL) IS INSTALLED ADHESIVE SIDE TO CHAS.

1 WIRE PER DIAGRAM 25222 USING ITEMS 14 THRU 17 (WIRE & SLEEVING) & USE ITEM 13 (LACING) TO TIE WIRE TO CHASSIS. (ITEMS NOT SHOWN IN F/D).

NOTES:

Figure 5-3. Data Discriminator Subchassis Assembly Diagram

-2	24710-2	4167-A1
-1	24710-1	4167-01
BSC	24710	4167-02

SUB CHASSIS ASSEMBLY

D 86141 24709 D

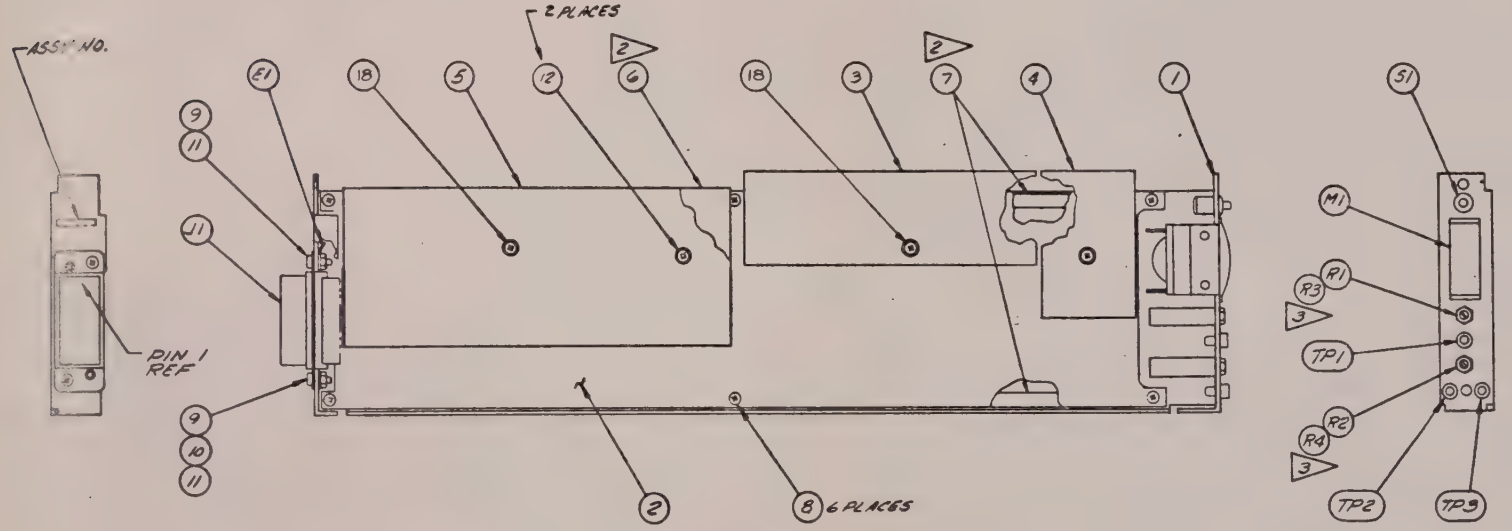


Figure 5-4. Reference Discriminator Subchassis Assembly Diagram

3 INSTALL R3 & R4 (RESISTORS) PER WIRING DIAGRAM 25227.

2 ITEM 7 (INSUL) IS INSTALLED ADHESIVE SIDE TO CHAS. AND ITEM 6 (INSUL) IS INSTALLED ADHESIVE SIDE TO PWA (ITEM 2)

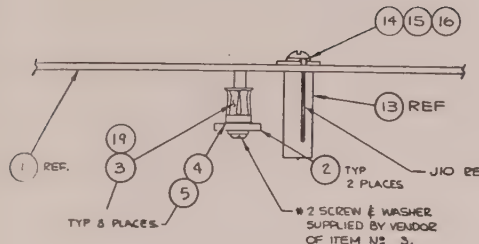
1 WIRE PER DIAGRAM 25227 USING ITEMS 14 THRU 16 (WIRE & SLEEVING) & USE ITEM 13 (LACING) TO TIE WIRE TO CHASSIS. (ITEMS NOT SHOWN IN F/D).

NOTES:

SUB CHASSIS ASSEMBLY

D 86141 25224 A

SH	DESCRIPTION	EFFECTIVITY	DATE	APPROVED
A	ECO 48261, ADD ITEMS 13,14,15 & 16		10/11/73	
B	ECO 48513 REVISED U2		11/20/73	
C	ECO 48594 INTERIM		12-10-73	
D	ECO 48597 ADD 804 (821 4641		12-10-73	
E	ECO 48848 READ NOTE 10 CHANGED		1-22-74	
F	ECO 50643 REVISED U2 (INTERIM)		10-14-74	
G	ECO 50645 REVISED U2		10-14-74	
H	ECO 52796 REVISED		11-18-75	
J	ECO 0900486 ADDED ITEM 19		1-28-83	2-21-83



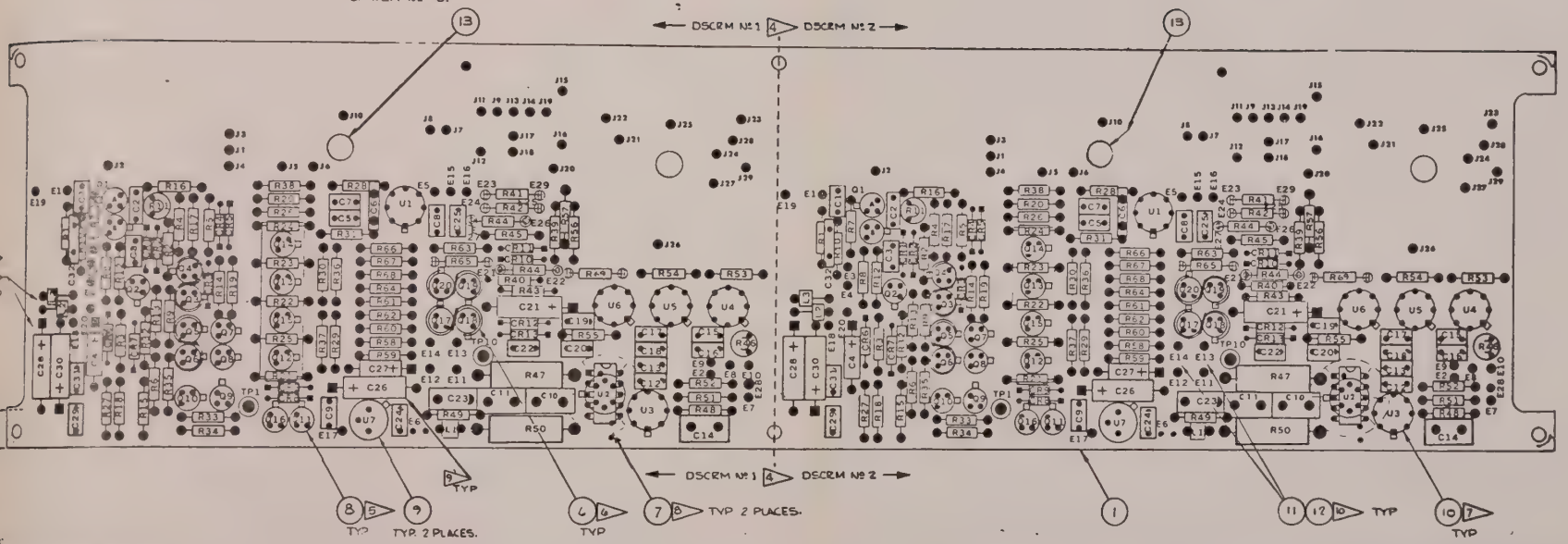


Figure 5-5. Discriminator Printed-Wiring Card Assembly Diagram

NOTES:
1. UNLESS OTHERWISE SPECIFIED:
   MAX HEIGHT, COMPONENT SIDE .580,
   NON-COMPONENT SIDE .093.
2. ■ SQUARE PAD INDICATES (+) POSITIVE END OF CAPACITORS, CATHODE END OF DIODES AND MECHANICAL ORIENTATION OF SYMMETRICAL MULTI-LEADED DEVICES.
3. NON-COMPONENT SIDE LEADS TO BE .050 MAX IN THIS AREA OF BOARD (.350) FOR ITS FULL LENGTH.
4. ALL COMPONENTS SHALL BE PREFIXED BY 1 FOR DSCRM №1 AND 2 FOR DSCRM №2.
5. ITEM 8 USED WITH Q1, 4 & 5, Q2 THRU Q20.
6. ITEM 6 USED WITH Q3 & Q4, Q5 & Q6, Q17 & Q18, Q19 & Q20.
7. ITEM 10 USED WITH U1 THRU U6.
8. ITEM 7 TO BE MOUNTED NOT TOUCHING U3.
9. LEAD SPACING FOR L2, L3, C26, C28 & C30 NON-STANDARD.
10. JUMPER, USING ITEM 11 & 12 (NOT SHOWN), E11 TO E13, E12 TO E14.
    FOR NEGATIVE SENSE ON 4167R JUMPER WIPER OF REV POT TO E7 & JUMPER E26 TO E9.
    FOR POSITIVE SENSE ON 4167A JUMPER WIPER OF REV POT TO E26 & JUMPER E7 TO E9.
11. FOR -1 CONFIG., INSTALL ITEM 11 & 12 (NOT SHOWN) IN LOCATION FOR 1L2 & 1L3.

X	205-89-01471		FOR PARTS LIST SEE PL-24687-1
X	205-89-01410		FOR PARTS LIST SEE PL-24637
-1	25093	4167-R	
ESC	24709	4167-A	

PARTS LIST

Schlumberger

PRINTED WIRING ASSEMBLY
DUAL DISCRIMINATOR

SIZE	CODE IDENT NO	DRAWING NO	REV
D	06141	24637	J

SCALE 2/1 | 205-89-01410 | SHEET 1

REVISIONS				
SYM	DESCRIPTION	SERIAL EFFECTIVE	DATE	APPROVED
A	ECO 47351 MOVE STOF	I FUP	5-15-73	
B	ECO 49086 ADDED ITEM 6	149 FUP	2-28-74	
C	ECO 57902 CHNG INFO 5	EP, PF	2-15-79	

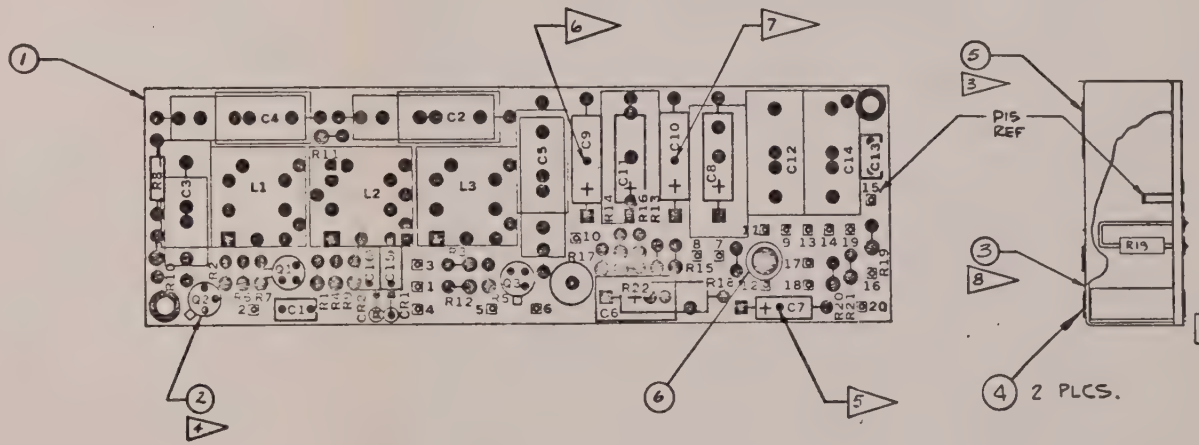


Figure 5-6. Channel Selector Printed-Wiring Card Assembly Diagram

NOTES:

UNLESS OTHERWISE SPECIFIED:

1. MAX HEIGHT, COMPONENT SIDE .600 , UNDER SHIELD, ITEM 3, NON-COMPONENT SIDE .040.
2. ■ SQUARE PAD INDICATES (+) POSITIVE END OF CAPACITORS, CATHODE END OF DIODES AND MECHANICAL ORIENTATION OF SYMMETRICAL MULTI-LEADED DEVICES.
3. APPLY APPLICABLE INFORMATION PER EMR 13406.
4. USE WITH Q1, Q2 & Q3.
5. WHEN C7 IS USED DRILL OUT PLATED THRU HOLE (.041" DRILL) TO A MAXIMUM DEPTH OF .030" TO AVOID DRILLING THRU BOARD & DAMAGING CONDUCTOR OTHER SIDE.
6. WHEN C9 IS USED DRILL OUT PLATED-THRU HOLE TO .041 DIA.
7. WHEN C10 IS USED DRILL OUT PLATED-THRU HOLE TO .041 DIA.
8. MOUNT ITEM 3 AFTER WAVE SOLDERING.

-2 REQUIRED	-1	BASIC	CHG LTR	PART NO	DESCRIPTION	PART CLASS	MFG CODE	ITEM OR SYMBOL
		■	A	205-89-01411	FOR PARTS LIST SEE PL-24640			

LIST OF MATERIALS

UNLESS OTHERWISE SPECIFIED — DO NOT SCALE DRAWING

DRAWN BY Tom Williams 3/14/73
DESIGNER S. Martinez 3/21/73
CHECKER 3/21/73
DESIGN ENGINEER
PROJECT ENGINEER 4/6/73

ECO FNA — — -3
DRAWING NEXT ASSY NO USED ON
APPLICATION
DO NOT ASSEMBLY PART NO. PER
LOCATE APPROX AS SHOWN
MATERIAL
TREATMENT OR FINISH

APPROVED R L Bird
APPROVED 3/28/73

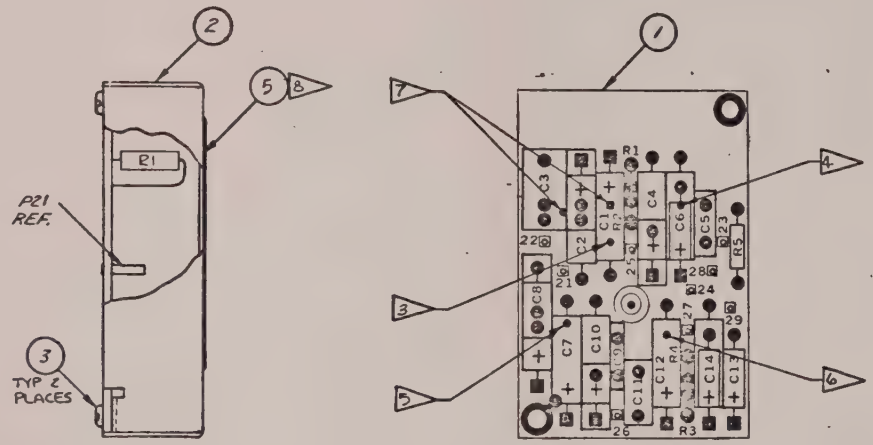
GPSOI CATEGORY VIM/LAB TO

ESE TELEMETRY DIVISION
ELECTRO-MECHANICAL RESEARCH, INC. • SARASOTA, FLORIDA

PRINTED-WIRING ASSY,
CHANNEL SELECTOR

CODE IDENT NO	SIZE	DWG NO	REV
06141	C	24640	C
SCALE 2/1	205-89-01411	SHEET 1 OF 1	

REVISIONS				
SYM	DESCRIPTION	SERIAL EFFECTIVE	DATE	APPROVED
A	E.C.O 49703 CHANGED FLAG NOTES 3,4,5&6	93-04 thru 165	8-18-76	



24643

8 APPLY APPLICABLE INFORMATION PER EMR 13406.

7 FOR REFERENCE OPERATION; DRILL OUT PLATED HOLE TO .041 DIA, DRILL SQUARE PAD ■ .032 DIA, INSTALL ITEM 4 (NOT SHOWN) IN SQUARE PAD ■, SOLDER TO BOTH SIDES OF BOARD.

6 WHEN C12 IS NOT USED INSTALL ITEM 4 (2 WIRE).

5 WHEN C7 IS NOT USED INSTALL ITEM 4 (2 WIRE).

4 WHEN C4 IS NOT USED INSTALL ITEM 4 (2 WIRE).

3 WHEN C1 IS NOT USED INSTALL ITEM 4 (2 WIRE).

2. ■ SQUARE PAD INDICATES (+) POSITIVE END OF CAPACITORS, CATHODE END OF DIODES AND MECHANICAL ORIENTATION OF SYMMETRICAL MULTI-LEADED DEVICES.

1. MAX HEIGHT A. COMPONENT SIDE .617
B. NON-COMPONENT SIDE .223.
MAX ALLOWABLE HEIGHT, COMPONENT SIDE .600.
UNDER SHIELD, ITEM 2.
UNLESS OTHERWISE SPECIFIED:

NOTES:

Figure 5-7. Low-Pass Output Filter Printed-Wiring Card Assembly Diagram

-2 REQUIRED	-1	BASIC	DASH NO	PART NO	DESCRIPTION	PART CLASS	MFG CODE	ITEM OR SYMBOL
			A	205-89-01412	FOR P/L SEE PL 24643			

LIST OF MATERIALS

350	FINAL	4167-C
APPLICATION		USED ON

GRADE	CATEGORY
II	II

UNLESS OTHERWISE SPECIFIED
DECIMALS ANGLES SURFACE FINISH
.XX ± .03 ± 1/2° 125
.XXX ± .010
ALL DIMENSIONS ARE IN INCHES
THREADS CLASS 2A OR 3B PER MIL-S-7742
REMOVE ALL BURRS AND SHARP EDGES .010 MAX
HOLE SIZES SPECIFIED PER ANSI SPEC Z57.5
DO NOT SCALE DRAWING

MATERIAL

TREATMENT OR FINISH

APPLY PART NO. PER

UPDATE APPROX AS SHOWN

		DATE
DRAWN BY	Sal Martino Jr	12-22-77
DESIGNED	Sal Martino Jr	12-22-77
CHECKER		
DESIGN ENGINEER		
PROJECT ENGINEER		4/6/78
APPROVED	R L Bush	
APPROVED		

EMR TELEMETRY DIVISION
ELECTRO-MECHANICAL RESEARCH, INC. • SARASOTA, FLORIDA

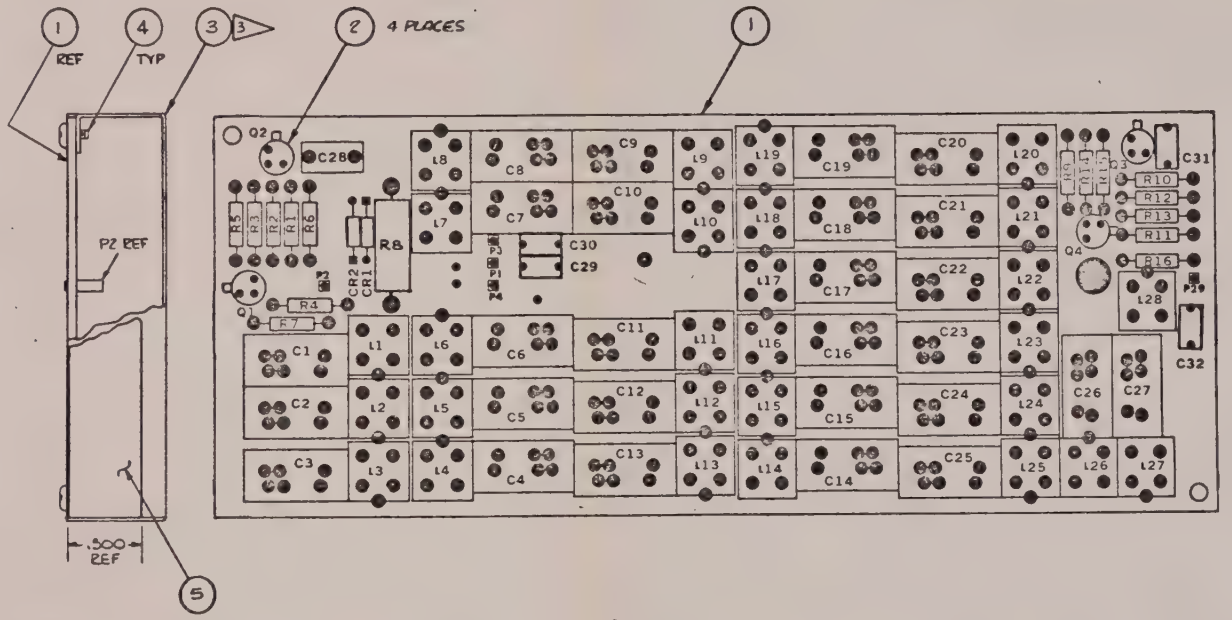
PRINTED WIRING ASSY
L.P.O.F.

EDC

CODE IDENT NO	SIZE		REV
06141	C	24643	A
SCALE 2/1	205-89-01412	SHEET 1 OF 1	

EMR 3, 2 174 OZALID

REVISIONS				
SYM	DESCRIPTION	SERIAL EFFECTIVE	DATE	APPROVED
A	ECO 47380, ADDED .8" HOLE	1 EUP	5-21-73	
B	ECO 48363, RESPACED R8, CHANGED COMP SIZE, RELOCATED.	PWB R11C 8 UP	3-30-74	



24992

NOTES:
UNLESS OTHERWISE SPECIFIED:

1. MAX HEIGHT, COMPONENT SIDE .600, UNDER SHIELD, NON-COMPONENT SIDE .093.
2. ■ SQUARE PAD INDICATES (+) POSITIVE END OF CAPACITORS, CATHODE END OF DIODES AND MECHANICAL ORIENTATION OF SYMMETRICAL MULTI-LEADED DEVICES.

3 INSTALL AFTER WAVE SOLDER.

Figure 5-8. Delay Line Printed-Wiring Card Assembly Diagram (Used Only in Reference Discriminator)

+2 REQUIRED	+1 REQUIRED	BASIC	DIVISION SYM	PART NO	DESCRIPTION	PART CLASS	MFG CODE	ITEM OR SYMBOL
	X	A		205-89-01413	FOR PARTS LIST SEE PL-24992			

LIST OF MATERIALS

BSC	25224	4167-B
WASH RC	MATERIAL	USED ON
	APPLICATION	
	DO NOT APPLY PART NO. PER	
	LOCATE APPROX AS SHOWN	

UNLESS OTHERWISE SPECIFIED
TOLERANCES — DECIMALS ± .01, .XX ± .010, .XXX ± .005; ANGLES ± 1/2°; SURFACE FINISH 125
ALL UNLESS OTHERWISE SPECIFIED HOLES TO BE ±.003 INCHES
TAPERED CLASS 2A OR 2B PER MIL-S-7742
REMOVE BURRS AND SHARP EDGES .020 MAX
HOLE ... PLATING PER SPEC ...
... PLATING PER SPEC ...
DO NOT SCALE DRAWING
MATERIAL
TREATMENT OR FINISH

DRAWN BY	S. Martin	3-29-73
DESIGNER	S. Martin	3-29-73
CHECKER	Ron Barbeau	4/14/73
DESIGN ENGINEER		
PROJECT ENGINEER		4/16/73
APPROVED	K L Bird	
APPROVED		

GRADE | CATEGORY | SIMILAR TO

TELEMETRY DIVISION
ELECTRO-MECHANICAL RESEARCH, INC. • SARASOTA, FLORIDA

PRINTED WIRING ASSEMBLY
DELAY LINE

CODE IDENT NO	SIZE		REV
06141	C	24992	B
SCALE 2/1	205-89-01413	SHEET 1	OF 1

SECTION 6

RECOMMENDED SPARES LIST AND REPLACEABLE PARTS LIST

6.1 GENERAL

This section contains information describing the replacement parts, recommended spares, spares provisioning, and ordering instructions for the EMR 4167. Assembly diagrams to be used in conjunction with the parts lists are supplied in Section 5 of this manual.

6.2 RECOMMENDED SPARES LISTS

The recommended spares lists for the 4167 are contained in Tables 6-1 through 6-2. The recommended spares as listed in these tables are based on the following conditions:

a. Operating Time - 8 hours/day, 5 days/week (2080 hours/year).

b. Operating Temperature - 0°C to 50°C.

c. User has capability to repair to the component level.

d. Failure rates are constant.

e. A 0.9 probability of being able to repair from the recommended complement for one year.

f. Equipment will be used as ground equipment (as opposed to vehicular or airborne).

The recommended spares tables contain the same type of information for each item as the parts list tables. However, only the recommended spare items for each 4167 configuration are listed. The total quantity of each item used in the equipment is provided as well as the number of recommended spares. For a system containing several 4167's, the total number of spares may be adjusted as desired. That is, the total number of spares need not be calculated in a 1:1 ratio based on the number of units.

6.3 PROVISIONING CONSIDERATIONS

The selection of an optimum spare parts complement involves a number of considerations known only to the user. These considerations include operating time and cycles, operating environment, number of equipments to be spared and their locations with

respect to one another, urgency of returning an equipment to service, troubleshooting, repair and test capability, stock of commonly used parts, etc.

Sparing considerations known to EMR include mean-time-between-failures for parts and assemblies under various operating environments, prices, relative ease of troubleshooting, repair, retest, etc.

The type of information required in order for FWSI to recommend an optimum spare parts complement for specific operating and logistic situations is outlined in the Customer Provisioning Questionnaire. If the information is supplied to FWSI, a recommended list will be furnished at no cost for each individual situation.

6.4 ORDERING INSTRUCTIONS

When ordering parts or assemblies from FWSI, the complete description of the part or assembly must accompany the order. Also included must be the FWSI component stock control number and the manufacturer part or assembly number.

6.5 REPLACEABLE PARTS LISTS

The replaceable parts lists for all assemblies of the 4167 are arranged in the order listed, contained in Table 6-6, which is a master list of all major equipments in the 4167.

Each parts list is computer prepared and lists all items and parts on an assembly. Each item of the parts list is identified by an item number or component designation in the ITEM NO. column. The numbers or designations in this column correspond directly to the numbers in reference balloons on the associated assembly diagrams. The component stock control number column contains the assigned 10-digit number of all items. The total quantity of an item or component on the assembly is listed in the Quantity UM column. Any replacement item for an assembly may be obtained directly from FWSI using this part number.

A complete description and proper name of the item or component is provided in the DESCRIPTION column. The MFR. PART/ASSY NO. column contains an FWSI assembly drawing or vendor part number under which the item or component is manufactured or purchased. A complete listing of all manufacturers and corresponding addresses is provided in Table 6-4.

Table 6-1. EMR 4167-01 Recommended Spares

ITEM NO.	PART DESCRIPTION	EMR STOCK NO.	VENDOR NAME	VENDOR PART NO.	TQ	RS	PRICE
001	DIODE, Ref., 9V/7.5mA, .005%	088-10-09461	Motorola	IN936A/ IN936B	2	1	
002	DIODE, Voltage Regulator, 13V ±5%	088-10-09642	JEDEC	IN964B	2	1	
003	DIODE, Switch, 75V/5UA, 4NS/10MA	088-10-41480	JEDEC	IN4148	16	2	
004	DIODE, Stabistor, .84-1.25V	088-10-48290	JEDEC	IN4829	4	1	
005	DIODE, Reference, 6.2V/7.5 mA	088-97-08230	Motorola	IN823	4	1	
006	INDUCTOR, Assembly	055-89-00001	Ferroxcube	213T0503E2A	6	1	
007	INTEGRATED CIRCUIT, Operational Amplifier, 18V	046-34-00004	NSC	LM301AH	2	1	
008	INTEGRATED CIRCUIT, Voltage Follower	046-34-00014	NSC	LM310H	4	1	
009	INTEGRATED CIRCUIT, Current Amplifier, DC to 30 MHz	046-34-00022	NSC	LH0002CH	2	1	
010	INTEGRATED CIRCUIT, Voltage Regulator, Neg. 15V, 1.5A	046-34-00023	NSC	LM320H15	2	1	
011	INTEGRATED CIRCUIT, Operational Amplifier, High-Slew	046-47-00001	Prcsn. Mono.	OP-01CJ	4	1	
012	JACK, Test Point, White	143-98-00006	Sealectro	SKT-8 or SKT-10	5	2	
013	JACK, Test Point, Black	143-98-00010	E.F. Johnson	105-853	2	1	
014	JACK, Test Point, Brown	143-98-00048	E.F. Johnson	105-858	2	1	
015	METER, Edgewise, L Bot., 0 Ctr.	170-99-00045	EMR-T	170-99-00045	2	1	
016	POTENTIOMETER, 500 ohms ±30%, 1/2W	201-98-00134	Beckman	62PR500	2	1	
017	POTENTIOMETER, 20 ohms ±30%, 1/2W	201-98-00146	Beckman	62PR20	2	1	
018	POTENTIOMETER, 1K ±10%, Cermet, 100 ppm	201-98-00272	Beckman	78SBWR1K	2	1	
019	POTENTIOMETER, 500 ohms ±10%, .75W	201-98-00273	Beckman	78SBWR500	2	1	
020	RESISTOR, 125 ohms ±3%, 3W	626-13-12509	EMR-T	626-13-12509	4	1	
021	TRANSISTOR, NPN, 75V, DC/UHF Amplifier	263-10-22221	Amelco	2N2222A	13	1	

Table 6-1 (Continued). EMR 4167-01 Recommended Spares

ITEM NO.	PART DESCRIPTION	EMR STOCK NO.	VENDOR NAME	VENDOR PART NO.	TQ	RS	PRICE
022	TRANSISTOR, PNP, Switch, 60V, HFE	263-10-29071	JEDEC	2N2907A	2	1	
023	TRANSISTOR, NPN, Switch, VCB, 15V	263-10-30100	JEDEC	2N3010	4	1	
024	TRANSISTOR, PNP, Switch/ Amplifier, 50V	263-10-32510	Motorola	2N3251	12	2	
025	TRANSISTOR, NPN, Matched Pair, VBE1-VBE2	263-35-00039	Amperex	A642/S	2	1	
026	TRANSISTOR, NPN, 15V, Sw., On	263-99-00019	G.E.	2N708	2	1	
027	TRANSISTOR, NPN, 20V, Sw., 350 MHz	263-99-00099	Motorola	2N2501	8	1	

Table 6-2. EMR 4167-02 Recommended Spares

ITEM NO.	PART DESCRIPTION	EMR STOCK NO.	VENDOR NAME	VENDOR PART NO.	TQ	RS	PRICE
001	DIODE, Ref., 9V/7.5mA, .005%	088-10-09361	Motorola	IN936A/ IN936B	2	1	
002	DIODE, Voltage Regulator, 13V ±5%	088-10-09642	JEDEC	IN964B	2	1	
003	DIODE, Switch, 75V/5UA, 4NS/10MA	088-10-41480	JEDEC	IN4148	16	2	
004	DIODE, Stabistor, .84-1.25V	088-10-48290	JEDEC	IN4829	4	1	
005	DIODE, Reference, 6.2V/7.5 mA	088-97-08230	Motorola	IN823	4	1	
006	INDUCTOR, Assembly	055-89-00001	Ferroxcube	213T050E2A	6	1	
007	INTEGRATED CIRCUIT, Operational Amplifier, 18V	046-34-00004	NSC	LM301AH	2	1	
008	INTEGRATED CIRCUIT, Voltage Follower	046-34-00014	NSC	LM310H	4	1	
009	INTEGRATED CIRCUIT, Current Amplifier, DC to 30 MHz	046-34-00022	NSC	LH0002CH	2	1	
010	INTEGRATED CIRCUIT, Voltage Regulator, Neg. 15V, 1.5A	046-34-00023	NSC	LM320H15	2	1	
011	INTEGRATED CIRCUIT, Operational Amplifier, High-Slew	046-47-00001	Prcsn. Mono.	OP-01CJ	4	1	
012	JACK, Test Point, White	143-98-00006	Sealectro	SKT-8 or SKT-10	5	2	
013	JACK, Test Point, Black	143-98-00010	E.F. Johnson	105-853	2	1	
014	JACK, Test Point, Brown	143-98-00048	E.F. Johnson	105-858	2	1	
015	METER, Edgewise, L Bot., 0 Ctr.	170-99-00045	EMR-T	170-99-00045	2	1	
016	POTENTIOMETER, 500 ohms ±30%, 1/2W	201-98-00134	Beckman	62PR500	2	1	
017	POTENTIOMETER, 20 ohms ±30%, 1/2W	201-98-00146	Beckman	62PR20	2	1	
018	POTENTIOMETER, 1K ±10%, Cermet, 100 ppm	201-98-00272	Beckman	78SBWR1K	2	1	
019	POTENTIOMETER, 500 ohms ±10%, .75W	201-98-00273	Beckman	78SBWR500	2	1	
020	RESISTOR, 125 ohms ±3%, 3W	626-13-12509	EMR-T	626-13-12509	4	1	
021	TRANSISTOR, NPN, 75V, DC/UHF Amplifier	263-10-22221	Amelco	2N2222A	13	1	

Table 6-2 (Continued). EMR 4167-02 Recommended Spares

ITEM NO.	PART DESCRIPTION	EMR STOCK NO.	VENDOR NAME	VENDOR PART NO.	TQ	RS	PRICE
022	TRANSISTOR, PNP, Switch, 60V, HFE	263-10-29071	JEDEC	2N2907A	2	1	
023	TRANSISTOR, NPN, Switch, VCB, 15V	263-10-30100	JEDEC	2N3010	4	1	
024	TRANSISTOR, PNP, Switch/ Amplifier, 50V	263-10-32510	Motorola	2N3251	12	2	
025	TRANSISTOR, NPN, Matched Pair, VBE1-VBE2	263-35-00039	Amperex	A642/S	2	1	
026	TRANSISTOR, NPN, 15V, Sw., On	263-99-00019	G.E.	2N708	2	1	
027	TRANSISTOR, NPN, 20V, Sw., 350 MHz	263-99-00099	Motorola	2N2501	8	1	

Table 6-3. EMR 4167R Recommended Spares

ITEM NO.	PART DESCRIPTION	EMR STOCK NO.	VENDOR NAME	VENDOR PART NO.	TQ	RS	PRICE
001	DIODE, Ref., 9V/7.5mA, .005%	088-10-09361	Motorola	IN936A/ IN936B	1	1	
002	DIODE, Voltage Regulator, 13V ±5%	088-10-09642	JEDEC	IN964B	1	1	
003	DIODE, Switch, 75V/5UA, 4NS/10MA	088-10-41480	JEDEC	IN4148	11	1	
004	DIODE, Stabistor, .84-1.25V	088-10-48290	JEDEC	IN4829	2	1	
005	DIODE, Reference, 6.2V/7.5 mA	088-97-08230	Motorola	IN823	2	1	
006	INDUCTOR, Assembly	055-89-00001	Ferroxcube	213T050E2A	3	1	
007	INTEGRATED CIRCUIT, Operational Amplifier, 18V	046-34-00004	NSC	LM301AH	1	1	
008	INTEGRATED CIRCUIT, Voltage Follower	046-34-00014	NSC	LM310H	2	1	
009	INTEGRATED CIRCUIT, Current Amplifier, DC to 30 MHz	046-34-00022	NSC	LH0002CH	1	1	
010	INTEGRATED CIRCUIT, Voltage Regulator, Neg. 15V, 1.5A	046-34-00023	NSC	LM320H15	1	1	
011	INTEGRATED CIRCUIT, Operational Amplifier, High-Slew	046-47-00001	Prcsn. Mono.	OP-01CJ	2	1	
012	JACK, Test Point, White	143-98-00006	Sealectro	SKT-8 or SKT-10	3	1	
013	JACK, Test Point, Black	143-98-00010	E.F. Johnson	105-853	1	1	
014	JACK, Test Point, Brown	143-98-00048	E.F. Johnson	105-858	1	1	
015	METER, Edgewise, L Bot., 0 Ctr.	170-99-00045	EMR-T	170-99-00045	1	1	
016	POTENTIOMETER, 500 ohms ±30%, 1/2W	201-98-00134	Beckman	62PR500	1	1	
017	POTENTIOMETER, 20 ohms ±30%, 1/2W	201-98-00146	Beckman	62PR20	1	1	
018	POTENTIOMETER, 1K ±10%, Cermet, 100 ppm	201-98-00272	Beckman	78SBWR1K	1	1	
019	POTENTIOMETER, 500 ohms ±10%, .75W	201-98-00273	Beckman	78SBWR500	1	1	
020	RESISTOR, 125 ohms ±3%, 3W	626-13-12509	EMR-T	626-13-12509	2	1	
021	TRANSISTOR, NPN, 75V, DC/UHF Amplifier	263-10-22221	Amelco	2N2222A	12	1	

Table 6-3 (Continued). EMR 4167R Recommended Spares

ITEM NO.	PART DESCRIPTION	EMR STOCK NO.	VENDOR NAME	VENDOR PART NO.	TQ	RS	PRICE
022	TRANSISTOR, PNP, Switch, 60V, HFE	263-10-29071	JEDEC	2N2907A	1	1	
023	TRANSISTOR, NPN, Switch, VCB, 15V	263-10-30100	JEDEC	2N3010	2	1	
024	TRANSISTOR, PNP, Switch/ Amplifier, 50V	263-10-32510	Motorola	2N3251	6	2	
025	TRANSISTOR, NPN, Matched Pair, VBE1-VBE2	263-35-00039	Amperex	A642/S	1	1	
026	TRANSISTOR, NPN, 15V, Sw., On	263-99-00019	G.E.	2N708	1	1	
027	TRANSISTOR, NPN, 20V, Sw., 350 MHz	263-99-00099	Motorola	2N2501	4	1	

Table 6-4. Vendor List

ABBREVIATION	VENDOR NAME AND ADDRESS
ALLEN BRAD	Allen-Bradley Co., Milwaukee, Wis.
AMATOM	Amathom Electronic Hdwr. Co., Inc., New Rochelle, N.Y.
AMELCO	Amelco Semiconductors, 1300 Terra Bella, Mountain View, Calif.
AMER SEALANT	American Sealants Co., Hartford, Conn.
AMP	Amp, Inc., Harrisburg, Pa.
AMPEREX	Amperex Electronic Co., Hicksville, N.Y.
AMPHENOL	Amphenol Corp., Los Gatos, Calif.
BECKMAN	Beckman Instruments, Inc., Fullerton, Calif.
C & K COMP.	C & K Components, Inc., Newton Mass.
DEL BLINN	Delbert Blinn Co., Pomona, Calif.
DOW CORNING	Dow Corning Corp., Midland, Michigan
E.F. JOHNSON	E.F. Johnson Co., Waseca, Minn.
EMR	EMR-Telemetry, Div. of Weston Instruments, Inc., P.O. Box 3041, Sarasota, Fla. 33578
ERIE	Erie Technological Products, Inc., Erie, Pa.
FERROXCUBE	Ferroxcube Corp. of America, Saugerties, Calif.
G.E.	General Electric Co., Miniature Lamp Dept., Cleveland, Ohio
GRAYHILL	Grayhill, Inc., La Orange, Ill.
GUBEBROD	Gubebrod Brothers Silk Co., Inc., 12 S. Twelfth Street, Philadelphia, Pa.
IERC	International Electronic Research Corp., Burbank, Calif.
JEDEC	Any Qualified Vendor

Table 6-4. Vendor List

ABBREVIATION	VENDOR NAME AND ADDRESS
MILTON ROSS	Milton Ross Metals Co., Southampton, Pa.
MML (NO.)	EMR-Telemetry Multiple Manufacturers List. See Table 6-5 for manufacturer's name and part number. (Parts may be ordered from EMR-Telemetry, Div. of Weston Instruments, Inc., Sarasota, Florida, using the 10-digit number in the EMR NUMBER column of the parts lists.)
MOTOROLA	Motorola Semiconductor Products, Inc., Phoenix, Ariz.
NAT SEMI	National Semiconductor Corp., Santa Clara, Calif.
NSC	National Semiconductor Corp., Santa Clara, Calif.
PRCSN MONO	Precision Monolithics, Inc., 1500 Space Park Dr., Santa Clara, Calif 95050
QVL	Qualified Vendor List
RAYCHEM	Raychem Corp., 300 Constitution Dr., Menlo Park, Calif.
SEALECTRO	Sealectro Corp., Mamaroneck, N.Y.
SEASTROM	Seastrom Mfg. Co., Glendale, Calif.
WAKEFIELD	Wakefield Engineering, Inc., Wakefield, Mass.
ZIERICK	Zierick Mfg. Corp., Radio Circle, Mount Kisco, N.Y.

Table 6-5. Multiple Manufacturers List

MML NUMBER	VENDOR NAME AND ADDRESS
MML 2	Motorola Semiconductor Products, Inc., Phoenix, Ariz. (or equivalent)
MML 4 Part No. 2N2222A	Amelco Semiconductors, 1300 Terra Bella, Mountain View, Calif. (or equivalent)
Part No. 2N3251	Motorola Semiconductor Products, Inc., Phoenix, Ariz. (or equivalent)
MML 16	Sealectro Corp., Mamaroneck, N.Y.
MML 40	National Semiconductor Corp., Santa Clara, Calif. (or equivalent)
MML 48	Erie Technological Products, Inc., Erie, Pa. (or equivalent)

Customer Provisioning Questionnaire

1.	Equipment to be spared Model No.(s): _____ Serial No.(s): _____
2.	Number of equipments to be spared in each location_____
3.	Operating time and cycle: _____ hours/day, _____ days/week.
4.	Operating Environment: A. Temperature: _____ B. Humidity: _____ C. Altitude: _____ D. Shock and Vibration: _____
5.	Non-operating Environment: _____ A. Temperature: _____ B. Humidity: _____ C. Altitude: _____
6.	Desired probability of being able to spare from complement _____ percent for _____ months.
7.	Can usage permit troubleshooting to parts level when a failure occurs? _____
8.	What spare assemblies do you have that are used in this Model Equipment? _____
9.	Do you wish to exclude the EMR warranty period? _____

Table 6-6. Parts List

Description	Number
Dual Subcarrier Discriminator Assembly	24710,-1 (089-89-00068, 089-89-00070)
Reference Discriminator Assembly	25100 (089-89-00069)
Sub-Chassis Assembly	24709,-1 (042-89-00187, 042-89-00203)
Sub-Chassis Assembly	25224 (042-89-00188)
Dual Discriminator PWA	24637,-1 (205-89-01410, 205-89-01471)
Channel Selector PWA	24640 (205-89-01411)
LPOF PWA	24643 (205-89-01412)
Delay Line PWA	24992 (205-89-01413)

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PARTS LIST: 25100 MFR. NAME: FWSI PARENT STK. CONT. NO.: 089-89-00069

DESCRIPTION: DSCRM,ASSY,REFERENCE MODEL 4167-RX UM: EA ECO NO.: RC00001 ENG. REV.: A@

ITEM NO.	COMPONENT STK. CONT. NO.	DESCRIPTION	QUANTITY	UM	MFR. NAME	MFR. PART/ASSY. NO.
001	042-99-00139	CHAS	1	EA	FWSI	25075
002	042-89-00188	CHAS,SUB,ASSY	1	EA	FWSI	25224
003	191-89-00544	PANEL,ASSY,FRONT	1	EA	FWSI	25225
004	075-89-00083	COVER,ASSY	1	EA	FWSI	25076
005	229-02-00183	SCREW,4-40X1/8,FLT HD	2	EA	PROCMT OPTN	MS51959-11
006	229-02-00184	SCREW,4-40X3/16,FLT HD	6	EA	PROMT OPTION	MS51959-12
007	273-02-00025	WASHER,#4,INT TOOTH	2	EA	PROMT OPTION	MS35333-70
008	287-02-00002	NUT,HEX, 4-40	2	EA	PROMT OPTION	MS35649-244
009	196-99-00156	PLATE,NAME EQUIP IDENT	1	EA	FWSI	10663
010	412-99-00006	IDENT	AR	EA	FWSI	15719
011	060-11-00001	CMPD,LOCKING,FINE THREAD	AR	EA	LOCTITE CORP	GRADE A /#277 RED
012	229-02-00072	SCREW,4-40X3/16 PAN HD	2	EA	PROMT OPTION	MS51957-12
REF001	905-05-00352	VAR CHART	AR	EA	FWSI	25226
REF002	905-07-00240	SPEC,ENGRG,MODEL 4167	AR	EA	FWSI	23622

END OF LIST

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PARTS LIST: 24710-1 MFR. NAME: FWSI PARENT STK. CONT. NO.: 089-89-00070

DESCRIPTION: DSCRM,ASSY,SUBCARR,DUAL 4167-01 UM: EA ECO NO.: RC00002 ENG. REV.: A0

ITEM NO.	COMPONENT STK. CONT. NO.	DESCRIPTION	QUANTITY	UM	MFR. NAME	MFR. PART/ASSY. NO.
001	042-99-00139	CHAS	1	EA	FWSI	25075
002	042-89-00203	CHAS,SUB,ASSY	1	EA	FWSI	24709-1
003	191-89-00548	PANEL,ASSY,FRONT	1	EA	FWSI	25221
004	075-89-00090	COVER,ASSY	1	EA	FWSI	25076-1
005	229-02-00183	SCREW,4-40X1/8,FLT HD	2	EA	PROCMT OPTN	MS51959-11
006	229-02-00184	SCREW,4-40X3/16,FLT HD	6	EA	PROMT OPTION	MS51959-12
007	273-02-00025	WASHER,#4,INT TOOTH	2	EA	PROMT OPTION	MS35333-70
008	287-02-00002	NUT,HEX, 4-40	2	EA	PROMT OPTION	MS35649-244
009	196-99-00156	PLATE,NAME EQUIP IDENT	1	EA	FWSI	10663
010	412-99-00010	IDENTIFIER	AR	EA	FWSI	24928
011	060-11-00001	CMPD,LOCKING,FINE THREAD	AR	EA	LOCTITE CORP	GRADE A /#277 RED
012	229-02-00072	SCREW,4-40X3/16 PAN HD	2	EA	PROMT OPTION	MS51957-12
REF001	905-05-00368	VAR CHART,MOD 4167-01&-02	AR	EA	FWSI	25519
REF002	905-07-00240	SPEC,ENGRG,MODEL 4167	AR	EA	FWSI	23622

END OF LIST

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PARTS LIST: 24710 MFR. NAME: FWSI PARENT STK. CONT. NO.: 089-89-00068

DESCRIPTION: DSCRM,ASSY,SUBCARR,DUAL 4167-02 UM: EA ECO NO.: RCD CHG ENG. REV.: BA

ITEM NO.	COMPONENT STK. CONT. NO.	DESCRIPTION	QUANTITY	UM	MFR. NAME	MFR. PART/ASSY. NO.
001	042-99-00139	CHAS	1	EA	FWSI	25075
002	042-89-00187	CHAS,SUB,ASSY	1	EA	FWSI	24709
003	191-89-00548	PANEL,ASSY,FRONT	1	EA	FWSI	25221
004	075-89-00090	COVER,ASSY	1	EA	FWSI	25076-1
005	229-02-00183	SCREW,4-40X1/8,FLT HD	6	EA	PROCMT OPTN	MS51959-11
006	229-02-00184	SCREW,4-40X3/16,FLT HD	2	EA	PROMT OPTION	MS51959-12
007	273-02-00025	WASHER,#4,INT TOOTH	2	EA	PROMT OPTION	MS35333-70
008	287-02-00002	NUT,HEX, 4-40	2	EA	PROMT OPTION	MS35649-244
009	196-99-00156	PLATE,NAME EQUIP IDENT	1	EA	FWSI	10663
010	412-99-00010	IDENTIFIER	2	EA	FWSI	24928
011	060-11-00001	CMPD,LOCKING,FINE THREAD	AR	EA	LOCTITE CORP	GRADE A /#277 RED
012	229-02-00072	SCREW,4-40X3/16 PAN HD	2	EA	PROMT OPTION	MS51957-12
REF001	905-05-00368	VAR CHART,MOD 4167-01&-02	AR	EA	FWSI	25519
REF002	905-07-00240	SPEC,ENGRG,MODEL 4167	AR	EA	FWSI	23622

END OF LIST

PARTS LIST: 24709-1 MFR. NAME: FWSI PARENT STK. CONT. NO.: 042-89-00203

DESCRIPTION: CHAS,SUB,ASSY UM: EA ECO NO.: 0400472 ENG. REV.: D*
4167-01

ITEM NO.	COMPONENT STK. CONT. NO.	DESCRIPTION	QUANTITY	UM	MFR. NAME	MFR. PART/ASSY. NO.
001	042-89-00186	CHAS,SUB,SUBASSY	1	EA	FWSI	24708
002	205-89-01410	PWA,DUAL DISCRIMINATOR	1	EA	FWSI	24637
003	205-89-01411	PWA,CHANNEL SELECTOR	AR	EA	FWSI	24640
004	205-89-01412	PWA,LPOF	AR	EA	FWSI	24643
005	140-99-00226	INSUL,1.125X1.312 NOTCHED	1	EA	FWSI	30264
006	140-99-00196	INSUL,.30X14.60X.01 THK	2	EA	FWSI	25289
008	229-02-00072	SCREW,4-40X3/16 PAN HD	6	EA	PROMT OPTION	MS51957-12
009	229-02-00074	SCREW,4-40X5/16 PAN HD	2	EA	PROMT OPTION	MS51957-14
010	273-02-00025	WASHER,#4,INT TOOTH	1	EA	PROMT OPTION	MS35333-70
011	287-02-00002	NUT,HEX, 4-40	2	EA	PROMT OPTION	MS35649-244
012	229-02-00079	SCREW,4-40X3/4 PAN HD	2	EA	PROMT OPTION	MS51957-19
013	070-98-00004	CD,NYL LACE,B FNSH,TYPE 1	AR	RL	QVL/GUDEBROD	MIL-T-43435/#20
014	276-98-00102	WIRE,#24,STRD,WHT,600V	35	FT	QPL 22759/11	NAS-703-24-U-C-9
015	276-02-00048	WIRE,#24,SOL, WHT, 600V	0.34	FT	PROMT OPTION	MIL-W-16878/4*SIL CTD*
016	276-98-00123	WIRE,#24,STRD,SHLD/JKT	9	FT	QVL	NAS-703-24-SJ-C-9
017	268-98-00001	TBG, 1/4 ,THERMO-FIT,WHT	1	FT	RACHEM/MML	RNF-100-1/4-WHT
018	229-02-00231	SCREW,4-40X1/4,100FLT HD	2	EA	QVL	MS24693-C2
019	252-98-00022	TAPE,GLASS CLOTH,1.0 WIDE	AR	EA	3M	27/BY DESCRIPTION
020	060-12-00004	CMPD,SEALANT,GENL PURPOSE	AR	EA	G.E.	RTV-102
021	273-02-00004	WASHER,#4, FLT ST STL	6	EA	PROMT OPTION	MS15795-803
022	276-02-00016	WIRE,#24,STRD,TW PR,600V	3	FT	PROMT OPTION	MIL-W-16878/4*SIL CTD*
023	276-02-00039	WIRE,#24,SOL, BLK, 600V	34	FT	PROMT OPTION	MIL-W-16878/4*SIL CTD*
E 001	255-98-00004	TERM,SLDR LUG, #4 STUD	1	EA	ZIERICK	409
J 001	063-98-00042	CONN,PLUG,16PIN,R&P	1	EA	AMPHENOL	26-159-16
M 001	170-99-00045	METER EDGW,L BOT,0 CTR	1	EA	FWSI	21441-4
M 002	170-99-00045	METER EDGW,L BOT,0 CTR	1	EA	FWSI	21441-4
R 001	201-98-00272	POT, 1K 10% CERMET 100PPM	1	EA	BECK/MML	78SBWR1K
R 002	201-98-00272	POT, 1K 10% CERMET 100PPM	1	EA	BECK/MML	78SBWR1K
R 003	201-98-00273	POT, 500 OHM 10% .75W	1	EA	BECK/MML	78SBWR500
R 004	201-98-00273	POT, 500 OHM 10% .75W	1	EA	BECK/MML	78SBWR500
R 005	608-09-15800	RES. 1.58K 1% 1/10W	1	EA	FWSI	624
R 006	608-09-15800	RES. 1.58K 1% 1/10W	1	EA	FWSI	624
S 001	250-98-00051	SW,PB,MOM,SPST NO 1A@115V	1	EA	GRAYHILL/C&K	30-1/8532*BY DESCR*
S 002	250-98-00051	SW,PB,MOM,SPST NO 1A@115V	1	EA	GRAYHILL/C&K	30-1/8532*BY DESCR*
TP001	143-98-00006	JACK,TEST PT,PNL TYPE,WHT	1	EA	MML 16	016-8010-209
TP002	143-98-00006	JACK,TEST PT,PNL TYPE,WHT	1	EA	MML 16	016-8010-209
TP003	143-98-00006	JACK,TEST PT,PNL TYPE,WHT	1	EA	MML 16	016-8010-209
TP004	143-98-00006	JACK,TEST PT,PNL TYPE,WHT	1	EA	MML 16	016-8010-209
TP005	143-98-00006	JACK,TEST PT,PNL TYPE,WHT	1	EA	MML 16	016-8010-209
REF001	905-13-00194	WIRING DIAGRAM	AR	EA	FWSI	25222

END OF LIST

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PARTS LIST: 24709 MFR. NAME: FWSI PARENT STK. CONT. NO.: 042-89-00187

DESCRIPTION: CHAS,SUB,ASSY UM: EA ECO NO.: 0400472 ENG. REV.: D*

4167-02

ITEM NO.	COMPONENT STK. CONT. NO.	DESCRIPTION	QUANTITY	UM	MFR. NAME	MFR. PART/ASSY. NO.
001	042-89-00186	CHAS,SUB,SUBASSY	1	EA	FWSI	24708
002	205-89-01410	PWA,DUAL DISCRIMINATOR	1	EA	FWSI	24637
003	205-89-01411	PWA,CHANNEL SELECTOR	AR	EA	FWSI	24640
004	205-89-01412	PWA,LPOF	AR	EA	FWSI	24643
005	140-99-00226	INSUL,1.125X1.312 NOTCHED	1	EA	FWSI	30264
006	140-99-00196	INSUL,.30X14.60X.01 THK	2	EA	FWSI	25289
008	229-02-00072	SCREW,4-40X3/16 PAN HD	6	EA	PROMT OPTION	MS51957-12
009	229-02-00074	SCREW,4-40X5/16 PAN HD	2	EA	PROMT OPTION	MS51957-14
010	273-02-00025	WASHER,#4,INT TOOTH	1	EA	PROMT OPTION	MS35333-70
011	287-02-00002	NUT,HEX, 4-40	2	EA	PROMT OPTION	MS35649-244
012	229-02-00079	SCREW,4-40X3/4 PAN HD	2	EA	PROMT OPTION	MS51957-19
013	070-98-00004	CD,NYL LACE,B FNSH,TYPE 1	AR	RL	QVL/GUDEBROD	MIL-T-43435/#20
014	276-98-00102	WIRE,#24,STRD,WHT,600V	35	FT	QPL 22759/11	NAS-703-24-U-C-9
015	276-02-00048	WIRE,#24,SOL, WHT, 600V	34	FT	PROMT OPTION	MIL-W-16878/4*SIL CTD*
016	276-98-00123	WIRE,#24,STRD,SHLD/JKT	9	FT	QVL	NAS-703-24-SJ-C-9
017	268-98-00001	TBG, 1/4 ,THERMO-FIT,WHT	1	FT	RACHEM/MML	RNF-100-1/4-WHT
018	229-02-00231	SCREW,4-40X1/4,100FLT HD	2	EA	QVL	MS24693-C2
019	252-98-00022	TAPE,GLASS CLOTH,1.0 WIDE	AR	EA	3M	27/BY DESCRIPTION
020	060-12-00004	CMPD,SEALANT,GENL PURPOSE	AR	EA	G.E.	RTV-102
021	273-02-00004	WASHER,#4, FLT ST STL	6	EA	PROMT OPTION	MS15795-803
022	276-02-00016	WIRE,#24,STRD,TW PR,600V	3	FT	PROMT OPTION	MIL-W-16878/4*SIL CTD*
023	276-02-00039	WIRE,#24,SOL, BLK, 600V	0.34	FT	PROMT OPTION	MIL-W-16878/4*SIL CTD*
E 001	255-98-00004	TERM,SLDR LUG, #4 STUD	1	EA	ZIERICK	409
J 001	063-98-00042	CONN,PLUG,16PIN,R&P	1	EA	AMPHENOL	26-159-16
M 001	170-99-00045	METER EDGW,L BOT,0 CTR	1	EA	FWSI	21441-4
M 002	170-99-00045	METER EDGW,L BOT,0 CTR	1	EA	FWSI	21441-4
R 001	201-98-00272	POT, 1K 10% CERMET 100PPM	1	EA	BECK/MML	78SBWR1K
R 002	201-98-00272	POT, 1K 10% CERMET 100PPM	1	EA	BECK/MML	78SBWR1K
R 003	201-98-00273	POT, 500 OHM 10% .75W	1	EA	BECK/MML	78SBWR500
R 004	201-98-00273	POT, 500 OHM 10% .75W	1	EA	BECK/MML	78SBWR500
R 005	608-09-15800	RES. 1.58K 1% 1/10W	1	EA	FWSI	624
R 006	608-09-15800	RES. 1.58K 1% 1/10W	1	EA	FWSI	624
S 001	250-98-00051	SW,PB,MOM,SPST NO 1A@115V	1	EA	GRAYHILL/C&K	30-1/8532*BY DESCR*
S 002	250-98-00051	SW,PB,MOM,SPST NO 1A@115V	1	EA	GRAYHILL/C&K	30-1/8532*BY DESCR*
TP001	143-98-00006	JACK,TEST PT,PNL TYPE,WHT	1	EA	MML 16	016-8010-209
TP002	143-98-00006	JACK,TEST PT,PNL TYPE,WHT	1	EA	MML 16	016-8010-209
TP003	143-98-00006	JACK,TEST PT,PNL TYPE,WHT	1	EA	MML 16	016-8010-209
TP004	143-98-00006	JACK,TEST PT,PNL TYPE,WHT	1	EA	MML 16	016-8010-209
TP005	143-98-00006	JACK,TEST PT,PNL TYPE,WHT	1	EA	MML 16	016-8010-209
REF001	905-13-00194	WIRING DIAGRAM	AR	EA	FWSI	25222

END OF LIST

DATE 07/18/84 FAIRCHILD WESTON INC. CODE IDENT. 06141 PAGE 1

PARTS LIST: 25224 MFR. NAME: FWSI PARENT STK. CONT. NO.: 042-89-00188

DESCRIPTION: CHAS,SUB,ASSY UM: EA ECO NO.: 0400492 ENG. REV.: D*
MODEL 4167-RX

ITEM NO.	COMPONENT STK. CONT. NO.	DESCRIPTION	QUANTITY	UM	MFR. NAME	MFR. PART/ASSY. NO.
001	042-89-00189	CHAS,SUB,SUBASSY	1	EA	FWSI	25093
002	205-89-01471	PWA,DUAL DISCRIMINATOR	1	EA	FWSI	24637-1
003	205-89-01411	PWA,CHANNEL SELECTOR	AR	EA	FWSI	24640
004	205-89-01412	PWA,LPOF	AR	EA	FWSI	24643
005	205-89-01413	PWA,DELAY LINE	AR	EA	FWSI	24992
006	140-99-00192	INSUL,CARD 2.75X6.9	1	EA	FWSI	25554
007	140-99-00196	INSUL,.30X14.60X.01 THK	2	EA	FWSI	25289
008	229-02-00072	SCREW,4-40X3/16 PAN HD	6	EA	PROMT OPTION	MS51957-12
009	229-02-00074	SCREW,4-40X5/16 PAN HD	2	EA	PROMT OPTION	MS51957-14
010	273-02-00025	WASHER,#4,INT TOOTH	1	EA	PROMT OPTION	MS35333-70
011	287-02-00002	NUT,HEX, 4-40	2	EA	PROMT OPTION	MS35649-244
012	229-02-00079	SCREW,4-40X3/4 PAN HD	2	EA	PROMT OPTION	MS51957-19
013	070-98-00004	CD,NYL LACE,B FNSH,TYPE 1	AR	RL	QVL/GUDEBROD	MIL-T-43435/#20
014	276-98-00102	WIRE,#24,STRD,WHT,600V	26	FT	QPL 22759/11	NAS-703-24-U-C-9
015	276-02-00048	WIRE,#24,SOL, WHT, 600V	0.34	FT	PROMT OPTION	MIL-W-16878/4*SIL CTD*
016	276-98-00123	WIRE,#24,STRD,SHLD/JKT	6	FT	QVL	NAS-703-24-SJ-C-9
017	268-98-00001	TBG, 1/4 ,THERMO-FIT,WHT	1.5	FT	RACHEM/MML	RNF-100-1/4-WHT
018	229-02-00231	SCREW,4-40X1/4,100FLT HD	2	EA	QVL	MS24693-C2
019	276-99-00009	WIRE,#24,BUSS,SOLID	0.34	FT	FWSI	619-24
E 001	255-98-00004	TERM,SLDR LUG, #4 STUD	1	EA	ZIERICK	409
J 001	063-98-00042	CONN,PLUG,16PIN,R&P	1	EA	AMPHENOL	26-159-16
M 001	170-99-00045	METER EDGW,L BOT,0 CTR	1	EA	FWSI	21441-4
R 001	201-98-00272	POT, 1K 10% CERMET 100PPM	1	EA	BECK/MML	78SBWR1K
R 002	201-98-00273	POT, 500 OHM 10% .75W	1	EA	BECK/MML	78SBWR500
R 003	608-09-15800	RES. 1.58K 1% 1/10W	1	EA	FWSI	624
R 004	608-09-49900	RES. 4.99K 1% 1/10W	1	EA	FWSI	624
S 001	250-99-00073	SW,TOGGLE,DPDT,ON-ON-MOM	1	EA	FWSI/MML	28396-10
TP001	143-98-00006	JACK,TEST PT,PNL TYPE,WHT	1	EA	MML 16	016-8010-209
TP002	143-98-00006	JACK,TEST PT,PNL TYPE,WHT	1	EA	MML 16	016-8010-209
TP003	143-98-00006	JACK,TEST PT,PNL TYPE,WHT	1	EA	MML 16	016-8010-209
REF001	905-13-00195	WIRING DIAGRAM	AR	EA	FWSI	25227

END OF LIST

PARTS LIST: 24637 MFR. NAME: FWSI PARENT STK. CONT. NO.: 205-89-01410

DESCRIPTION: PWA,DUAL DISCRIMINATOR STD UM: EA ECO NO.: 0400744 ENG. REV.: M*

ITEM NO.	COMPONENT STK. CONT. NO.	DESCRIPTION	QUANTITY	UM	MFR. NAME	MFR. PART/ASSY. NO.
001	204-89-00472	PWB,DUAL DISCRIMINATOR	1	EA	FWSI	24636
002	298-99-00038	HTSK,BAR	2	EA	FWSI	22855
003	298-98-00017	HTSK TO-18 2-56 SCREW	8	EA	IERC	TXB2P-019-028B
004	060-21-00002	CMPD,HEAT CONDUCTIVE GEL	AR	EA	DOW CORNING	DOW CORNING 340
005	273-98-00058	WASHER,.1091DX.2500D,MICA	8	EA	SEASTROM	5624-8-5
006	049-98-00010	CLIP,THERMAL EQUALIZING	8	EA	WAKEFIELD	259-18-25
007	298-98-00008	HTSK,FOR TO-5 PKG	2	EA	IERC/MML	TXBF-032-025B
008	189-98-00004	PAD,XSTR 4 PIN*USE OPTL*	42	EA	DEL BLINN	100-000-NY
009	189-99-00001	PAD,XSTR TO-5,9 OR 11,4 P	2	EA	FWSI	800-1
010	189-98-00011	PAD,XSTR,TO-5 8PIN,.075H	12	EA	MILTON ROSS	10193-DAP
011	276-02-00037	WIRE,#22,SOL, WHT, 600V	0.6	FT	PROMT OPTION	MIL-W-16878/4*SIL CTD*
013	239-99-00125	SPACER,MOD,.250DIA X .75L	2	EA	FWSI	27564
014	273-02-00004	WASHER,#4, FLT ST STL	2	EA	PROMT OPTION	MS15795-803
015	273-02-00025	WASHER,#4,INT TOOTH	2	EA	PROMT OPTION	MS35333-70
016	229-02-00074	SCREW,4-40X5/16 PAN HD	2	EA	PROMT OPTION	MS51957-14
PIN001	065-98-00045	CONT,PIN,.025SQ, .620L	58	EA	BERG ELECT	75481-014
REF001	905-01-10004	SCHEM,PWA,DUAL DISCR	AR	EA	FWSI	24635
REF002	905-04-00001	SPEC,COMPONENT SPACING	AR	EA	FWSI	9500
REF003	204-89-00472	PWB,DUAL DISCRIMINATOR	AR	EA	FWSI	24636
1C 001	301-13-10003	CAP,CR , 50V 1.00UF 20%	1	EA	ERIE/MML	8131-050-651-105M
1C 002	301-71-10001	CAP,CR,50V .01UF +80,-20%	1	EA	ERIE/MML	GP50-103ZC/TA-.01
1C 003	301-13-10002	CAP,CR , 50V .100 UF 20%	1	EA	ERIE/MML	8131-050-651-104M
1C 004	336-12-33003	CAP., 3.3MF 10% 15V	1	EA	FWSI	601
1C 005	301-13-10002	CAP,CR , 50V .100 UF 20%	1	EA	ERIE/MML	8131-050-651-104M
1C 006	304-08-03009	CAP. 30PF .5PF 500V	1	EA	FWSI	600
1C 007	301-13-10002	CAP,CR , 50V .100 UF 20%	1	EA	ERIE/MML	8131-050-651-104M
1C 008	301-13-10002	CAP,CR , 50V .100 UF 20%	1	EA	ERIE/MML	8131-050-651-104M
1C 009	301-13-10002	CAP,CR , 50V .100 UF 20%	1	EA	ERIE/MML	8131-050-651-104M
1C 010	304-13-05109	CAP. 51PF 1% 500V	1	EA	FWSI	600
1C 011	304-13-05109	CAP. 51PF 1% 500V	1	EA	FWSI	600
1C 012	301-13-10002	CAP,CR , 50V .100 UF 20%	1	EA	ERIE/MML	8131-050-651-104M
1C 013	301-13-10002	CAP,CR , 50V .100 UF 20%	1	EA	ERIE/MML	8131-050-651-104M
1C 014	304-08-02009	CAP.,20PF .5PF 500V	1	EA	FWSI	600
1C 015	301-13-10002	CAP,CR , 50V .100 UF 20%	1	EA	ERIE/MML	8131-050-651-104M
1C 016	301-13-10002	CAP,CR , 50V .100 UF 20%	1	EA	ERIE/MML	8131-050-651-104M
1C 017	301-13-10002	CAP,CR , 50V .100 UF 20%	1	EA	ERIE/MML	8131-050-651-104M
1C 018	301-13-10002	CAP,CR , 50V .100 UF 20%	1	EA	ERIE/MML	8131-050-651-104M
1C 019	301-13-10002	CAP,CR , 50V .100 UF 20%	1	EA	ERIE/MML	8131-050-651-104M
1C 020	301-13-10002	CAP,CR , 50V .100 UF 20%	1	EA	ERIE/MML	8131-050-651-104M
1C 021	337-12-22004	CAP., 22MF 10% 15V	1	EA	FWSI	601
1C 022	301-13-10002	CAP,CR , 50V .100 UF 20%	1	EA	ERIE/MML	8131-050-651-104M

CONTINUED

PARTS LIST: 24637 MFR. NAME: FWSI PARENT STK. CONT. NO.: 205-89-01410

DESCRIPTION: PWA,DUAL DISCRIMINATOR STD UM: EA ECO NO.: 0400744 ENG. REV.: M*

ITEM NO.	COMPONENT STK. CONT. NO.	DESCRIPTION	QUANTITY	UM	MFR. NAME	MFR. PART/ASSY. NO.
1C 023	384-05-10001	CAP., .0100MF 1% 50V	1	EA	FWSI	949
1C 024	301-13-10002	CAP,CR , 50V .100 UF 20%	1	EA	ERIE/MML	8131-050-651-104M
1C 025	301-13-10002	CAP,CR , 50V .100 UF 20%	1	EA	ERIE/MML	8131-050-651-104M
1C 026	338-14-15004	CAP., 15MF 10% 35V	1	EA	FWSI	601
1C 027	336-14-10003	CAP. 1.0MF 10% 35V	1	EA	FWSI	601
1C 028	338-14-15004	CAP., 15MF 10% 35V	1	EA	FWSI	601
1C 029	301-13-10002	CAP,CR , 50V .100 UF 20%	1	EA	ERIE/MML	8131-050-651-104M
1C 030	338-14-15004	CAP., 15MF 10% 35V	1	EA	FWSI	601
1C 031	301-13-10002	CAP,CR , 50V .100 UF 20%	1	EA	ERIE/MML	8131-050-651-104M
1C 032	304-01-01509	CAP. 15PF .5PF 500V	1	EA	FWSI	600
1CR001	088-10-41480	DIODE,SW,75V/5UA,4NS/10MA	1	EA	CODI/MML	1N4148
1CR002	088-10-41480	DIODE,SW,75V/5UA,4NS/10MA	1	EA	CODI/MML	1N4148
1CR003	088-10-41480	DIODE,SW,75V/5UA,4NS/10MA	1	EA	CODI/MML	1N4148
1CR004	088-10-41480	DIODE,SW,75V/5UA,4NS/10MA	1	EA	CODI/MML	1N4148
1CR005	088-10-41480	DIODE,SW,75V/5UA,4NS/10MA	1	EA	CODI/MML	1N4148
1CR006	088-10-09361	DIODE,REF,9V/7.5MA,.005 %	1	EA	MOT/MML	1N936A/1N936B
1CR007	088-10-09642	DIODE,ZENER 0.4W 13.0V	1	EA	CODI/MML	1N964B
1CR008	088-10-41480	DIODE,SW,75V/5UA,4NS/10MA	1	EA	CODI/MML	1N4148
1CR009	088-10-41480	DIODE,SW,75V/5UA,4NS/10MA	1	EA	CODI/MML	1N4148
1CR010	088-10-48290	DIODE,STABISTOR,.84-1.25V	1	EA	CODI/MML	1N4829
1CR011	088-10-48290	DIODE,STABISTOR,.84-1.25V	1	EA	CODI/MML	1N4829
1CR012	088-97-08230	DIODE,REF. 6.2V@7.5MA	1	EA	MOT/MML	1N823,A
1CR013	088-97-08230	DIODE,REF. 6.2V@7.5MA	1	EA	MOT/MML	1N823,A
1L 001	055-89-00001	L,ASSY	1	EA	FWSI	956-1306
1L 002	055-89-00001	L,ASSY	1	EA	FWSI	956-1306
1L 003	055-89-00001	L,ASSY	1	EA	FWSI	956-1306
1Q 001	263-35-00039	XSTR,NPN,MAT.PR,VBE1-VBE2	1	EA	AMPEREX	A642/S
1Q 002	263-99-00019	XSTR,NPN 2N708,15V SW,ON	1	EA	FCH/MML	2N708
1Q 003	263-97-00093	XSTR,PNP,SWITCH/AMPL,50V	1	EA	FCH/MML	2N3251
1Q 004	263-97-00093	XSTR,PNP,SWITCH/AMPL,50V	1	EA	FCH/MML	2N3251
1Q 005	263-97-00093	XSTR,PNP,SWITCH/AMPL,50V	1	EA	FCH/MML	2N3251
1Q 006	263-97-00093	XSTR,PNP,SWITCH/AMPL,50V	1	EA	FCH/MML	2N3251
1Q 007	263-10-22221	XSTR,NPN 75V,DC/UHF AMPL	1	EA	FCH/MML	2N2222A
1Q 008	263-10-22221	XSTR,NPN 75V,DC/UHF AMPL	1	EA	FCH/MML	2N2222A
1Q 009	263-97-00093	XSTR,PNP,SWITCH/AMPL,50V	1	EA	FCH/MML	2N3251
1Q 010	263-97-00093	XSTR,PNP,SWITCH/AMPL,50V	1	EA	FCH/MML	2N3251
1Q 011	263-97-23691	XSTR,NPN SW,HS VCEO 15V	1	EA	FCH/MML	2N2369A
1Q 012	263-97-23691	XSTR,NPN SW,HS VCEO 15V	1	EA	FCH/MML	2N2369A
1Q 013	263-97-23691	XSTR,NPN SW,HS VCEO 15V	1	EA	FCH/MML	2N2369A
1Q 014	263-97-23691	XSTR,NPN SW,HS VCEO 15V	1	EA	FCH/MML	2N2369A
1Q 015	263-97-23691	XSTR,NPN SW,HS VCEO 15V	1	EA	FCH/MML	2N2369A

CONTINUED

PARTS LIST: 24637 MFR. NAME: FWSI PARENT STK. CONT. NO.: 205-89-01410

DESCRIPTION: PWA,DUAL DISCRIMINATOR STD UM: EA ECO NO.: 0400744 ENG. REV.: M*

ITEM NO.	COMPONENT STK. CONT. NO.	DESCRIPTION	QUANTITY	UM	MFR. NAME	MFR. PART/ASSY. NO.
1Q 016	263-97-23691	XSTR,NPN SW,HS VCEO 15V	1	EA	FCH/MML	2N2369A
1Q 017	263-10-22221	XSTR,NPN 75V,DC/UHF AMPL	1	EA	FCH/MML	2N2222A
1Q 018	263-10-22221	XSTR,NPN 75V,DC/UHF AMPL	1	EA	FCH/MML	2N2222A
1Q 019	263-10-29071	XSTR,PNP SW 60V,HFE 100	1	EA	FCH/MML	2N2907A
1Q 020	263-10-22221	XSTR,NPN 75V,DC/UHF AMPL	1	EA	FCH/MML	2N2222A
1R 001	616-02-51009	RES,510 OHM 5% 1/4W	1	EA	ALLEN BRAD	RC07GF511J
1R 002	608-09-42200	RES, 4.22K 1% 1/10W	1	EA	FWSI	624
1R 003	616-02-05109	RES,51 OHM 5% 1/4W	1	EA	ALLEN BRAD	RC07GF510J
1R 004	608-09-10000	RES. 1K 1% 1/10W	1	EA	FWSI	624
1R 005	616-02-12000	RES,1.2K 5% 1/4W	1	EA	ALLEN BRAD	RC07GF122J
1R 006	608-09-60400	RES, 6.04K 1% 1/10W	1	EA	FWSI	624
1R 007	616-02-10000	RES,1K 5% 1/4W	1	EA	ALLEN BRAD	RC07GF102J
1R 008	616-02-10000	RES,1K 5% 1/4W	1	EA	ALLEN BRAD	RC07GF102J
1R 009	616-02-10009	RES,100 OHM 5% 1/4W	1	EA	ALLEN BRAD	RC07GF101J
1R 010	616-02-10001	RES,10K 5% 1/4W	1	EA	ALLEN BRAD	RC07GF103J
1R 011	201-98-00146	POT,TRMR, 20 OHM 20% .5W	1	EA	BECK/MML	62PR20
1R 012	616-02-10001	RES,10K 5% 1/4W	1	EA	ALLEN BRAD	RC07GF103J
1R 013	616-02-39000	RES,3.9K 5% 1/4W	1	EA	ALLEN BRAD	RC07GF392J
1R 014	616-02-20009	RES,200 OHM 5% 1/4W	1	EA	ALLEN BRAD	RC07GF201J
1R 015	616-02-20009	RES,200 OHM 5% 1/4W	1	EA	ALLEN BRAD	RC07GF201J
1R 016	608-09-43200	RES, 4.32K 1% 1/10W	1	EA	FWSI	624
1R 017	608-09-51100	RES, 5.11K 1% 1/10W	1	EA	EMR	624
1R 018	616-02-39000	RES,3.9K 5% 1/4W	1	EA	ALLEN BRAD	RC07GF392J
1R 019	616-02-12001	RES,12K 5% 1/4W	1	EA	ALLEN BRAD	RC07GF123J
1R 020	608-09-10201	RES, 10.2K 1% 1/10W	1	EA	FWSI	624
1R 021	608-09-20000	RES. 2.0K 1% 1/10W	1	EA	FWSI	624
1R 022	608-09-11800	RES, 1.18K 1% 1/10W	1	EA	FWSI	624
1R 023	616-02-10009	RES,100 OHM 5% 1/4W	1	EA	ALLEN BRAD	RC07GF101J
1R 024	608-09-20000	RES. 2.0K 1% 1/10W	1	EA	FWSI	624
1R 025	608-09-20000	RES. 2.0K 1% 1/10W	1	EA	FWSI	624
1R 026	608-09-10201	RES, 10.2K 1% 1/10W	1	EA	FWSI	624
1R 027	608-09-30100	RES. 3.01K 1% 1/10W	1	EA	FWSI	624
1R 028	616-02-10009	RES,100 OHM 5% 1/4W	1	EA	ALLEN BRAD	RC07GF101J
1R 029	608-09-10000	RES. 1K 1% 1/10W	1	EA	FWSI	624
1R 030	608-09-10000	RES. 1K 1% 1/10W	1	EA	FWSI	624
1R 031	616-02-10009	RES,100 OHM 5% 1/4W	1	EA	ALLEN BRAD	RC07GF101J
1R 032	616-02-12009	RES,120 OHM 5% 1/4W	1	EA	ALLEN BRAD	RC07GF121J
1R 033	608-09-10000	RES. 1K 1% 1/10W	1	EA	FWSI	624
1R 034	608-09-10000	RES. 1K 1% 1/10W	1	EA	FWSI	624
1R 035	616-02-12009	RES,120 OHM 5% 1/4W	1	EA	ALLEN BRAD	RC07GF121J
1R 036	608-09-10000	RES. 1K 1% 1/10W	1	EA	FWSI	624

CONTINUED

PARTS LIST: 24637 MFR. NAME: FWSI PARENT STK. CONT. NO.: 205-89-01410

DESCRIPTION: PWA,DUAL DISCRIMINATOR STD UM: EA ECO NO.: 0400744 ENG. REV.: M*

ITEM NO.	COMPONENT STK. CONT. NO.	DESCRIPTION	QUANTITY	UM	MFR. NAME	MFR. PART/ASSY. NO.
1R 037	608-09-49909	RES, 499.0 OHM 1% 1/10W	1	EA	FWSI	624
1R 038	608-09-10000	RES. 1K 1% 1/10W	1	EA	FWSI	624
1R 039	608-09-49900	RES. 4.99K 1% 1/10W	1	EA	FWSI	624
1R 040	608-09-24300	RES, 2.43K 1% 1/10W	1	EA	FWSI	624
1R 041	608-09-00000	RES,*TVAR* 1%,1/10W	AR	EA	FWSI	624
1R 042	608-09-00000	RES,*TVAR* 1%,1/10W	AR	EA	FWSI	624
1R 043	608-09-24300	RES, 2.43K 1% 1/10W	1	EA	FWSI	624
1R 044	608-09-24300	RES, 2.43K 1% 1/10W	1	EA	FWSI	624
1R 045	608-09-63400	RES, 6.34K 1% 1/10W	1	EA	EMR	624
1R 046	201-98-00134	POT,TRMR,500 OHM 10% .5W	1	EA	BECK/MML	62PR500
1R 047	626-13-12509	RES, 125 OHM 3% 3W	1	EA	FWSI	621*125041
1R 048	608-09-10201	RES, 10.2K 1% 1/10W	1	EA	FWSI	624
1R 049	616-02-00279	RES, 2.7 OHM 5% 1/4W	1	EA	ALLEN BRAD	RC07GF2R7J
1R 050	626-13-12509	RES, 125 OHM 3% 3W	1	EA	FWSI	621*125041
1R 051	608-09-10000	RES. 1K 1% 1/10W	1	EA	FWSI	624
1R 052	608-09-10000	RES. 1K 1% 1/10W	1	EA	FWSI	624
1R 053	616-02-51000	RES,5.1K 5% 1/4W	1	EA	ALLEN BRAD	RC07GF512J
1R 054	616-02-51000	RES,5.1K 5% 1/4W	1	EA	ALLEN BRAD	RC07GF512J
1R 055	608-09-30900	RES, 3.09K 1% 1/10W	1	EA	FWSI	624
1R 056	608-09-10000	RES. 1K 1% 1/10W	1	EA	FWSI	624
1R 057	608-09-49909	RES, 499.0 OHM 1% 1/10W	1	EA	FWSI	624
1R 058	608-09-18700	RES, 1.87K 1% 1/10W	1	EA	FWSI	624
1R 059	608-09-12400	RES, 1.24K 1% 1/10W	1	EA	FWSI	624
1R 060	616-02-10009	RES,100 OHM 5% 1/4W	1	EA	ALLEN BRAD	RC07GF101J
1R 061	616-02-10009	RES,100 OHM 5% 1/4W	1	EA	ALLEN BRAD	RC07GF101J
1R 062	608-09-10200	RES, 1.02K 1% 1/10W	1	EA	EMR	624
1R 063	608-09-12101	RES, 12.1K 1% 1/10W	1	EA	FWSI	624
1R 064	616-02-10009	RES,100 OHM 5% 1/4W	1	EA	ALLEN BRAD	RC07GF101J
1R 065	608-09-00000	RES,*TVAR* 1%,1/10W	AR	EA	FWSI	624
1R 066	616-02-05109	RES,51 OHM 5% 1/4W	1	EA	ALLEN BRAD	RC07GF510J
1R 067	608-09-27400	RES. 2.74K 1% 1/10W	1	EA	FWSI	624
1R 068	608-09-63409	RES, 634.0 OHM 1% 1/10W	1	EA	EMR	624
1R 069	608-09-00000	RES,*TVAR* 1%,1/10W	AR	EA	FWSI	624
1TP001	143-98-00048	JACK,TEST PT,PW TYPE,BRN	1	EA	E F JOHNSON	105-0858-001
1TP010	143-98-00010	JACK,TEST PT,PW TYPE,BLK	1	EA	E F JOHNSON	105-0853-001
1U 001	046-34-00004	IC,LIN AMPL,OPNL	1	EA	NSC/MML	LM301AH
1U 002	046-34-00022	IC,LIN AMPL,CUR DC/30MHZ	1	EA	NSC/MML	LH0002CH
1U 003	046-47-00001	IC,LIN AMPL,OPNL,COMPEN	1	EA	PMI/MICRO PR	OP-01CJ/EJ MP5501CJ/EJ
1U 004	046-34-00014	IC,LIN VOLTAGE FOLLOWER	1	EA	NSC/MML	LM310H
1U 005	046-34-00014	IC,LIN VOLTAGE FOLLOWER	1	EA	NSC/MML	LM310H
1U 006	046-47-00001	IC,LIN AMPL,OPNL,COMPEN	1	EA	PMI/MICRO PR	OP-01CJ/EJ MP5501CJ/EJ

CONTINUED

PARTS LIST: 24637 MFR. NAME: FWSI PARENT STK. CONT. NO.: 205-89-01410

DESCRIPTION: PWA,DUAL DISCRIMINATOR STD UM: EA ECO NO.: 0400744 ENG. REV.: M*

ITEM NO.	COMPONENT STK. CONT. NO.	DESCRIPTION	QUANTITY	UM	MFR. NAME	MFR. PART/ASSY. NO.
1U 007	046-34-00023	IC,LIN RGLTR, 15V,NEG,.2A	1	EA	NSC/MML	LM320H15
2C 001	301-13-10003	CAP,CR , 50V 1.00UF 20%	1	EA	ERIE/MML	8131-050-651-105M
2C 002	301-71-10001	CAP,CR,50V .01UF +80,-20%	1	EA	ERIE/MML	GP50-103ZC/TA-.01
2C 003	301-13-10002	CAP,CR , 50V .100 UF 20%	1	EA	ERIE/MML	8131-050-651-104M
2C 004	336-12-33003	CAP., 3.3MF 10% 15V	1	EA	FWSI	601
2C 005	301-13-10002	CAP,CR , 50V .100 UF 20%	1	EA	ERIE/MML	8131-050-651-104M
2C 006	304-08-03009	CAP. 30PF .5PF 500V	1	EA	FWSI	600
2C 007	301-13-10002	CAP,CR , 50V .100 UF 20%	1	EA	ERIE/MML	8131-050-651-104M
2C 008	301-13-10002	CAP,CR , 50V .100 UF 20%	1	EA	ERIE/MML	8131-050-651-104M
2C 009	301-13-10002	CAP,CR , 50V .100 UF 20%	1	EA	ERIE/MML	8131-050-651-104M
2C 010	304-13-05109	CAP. 51PF 1% 500V	1	EA	FWSI	600
2C 011	304-13-05109	CAP. 51PF 1% 500V	1	EA	FWSI	600
2C 012	301-13-10002	CAP,CR , 50V .100 UF 20%	1	EA	ERIE/MML	8131-050-651-104M
2C 013	301-13-10002	CAP,CR , 50V .100 UF 20%	1	EA	ERIE/MML	8131-050-651-104M
2C 014	304-08-02009	CAP.,20PF .5PF 500V	1	EA	FWSI	600
2C 015	301-13-10002	CAP,CR , 50V .100 UF 20%	1	EA	ERIE/MML	8131-050-651-104M
2C 016	301-13-10002	CAP,CR , 50V .100 UF 20%	1	EA	ERIE/MML	8131-050-651-104M
2C 017	301-13-10002	CAP,CR , 50V .100 UF 20%	1	EA	ERIE/MML	8131-050-651-104M
2C 018	301-13-10002	CAP,CR , 50V .100 UF 20%	1	EA	ERIE/MML	8131-050-651-104M
2C 019	301-13-10002	CAP,CR , 50V .100 UF 20%	1	EA	ERIE/MML	8131-050-651-104M
2C 020	301-13-10002	CAP,CR , 50V .100 UF 20%	1	EA	ERIE/MML	8131-050-651-104M
2C 021	337-12-22004	CAP., 22MF 10% 15V	1	EA	FWSI	601
2C 022	301-13-10002	CAP,CR , 50V .100 UF 20%	1	EA	ERIE/MML	8131-050-651-104M
2C 023	384-05-10001	CAP., .0100MF 1% 50V	1	EA	FWSI	949
2C 024	301-13-10002	CAP,CR , 50V .100 UF 20%	1	EA	ERIE/MML	8131-050-651-104M
2C 025	301-13-10002	CAP,CR , 50V .100 UF 20%	1	EA	ERIE/MML	8131-050-651-104M
2C 026	338-14-15004	CAP., 15MF 10% 35V	1	EA	FWSI	601
2C 027	336-14-10003	CAP. 1.0MF 10% 35V	1	EA	FWSI	601
2C 028	338-14-15004	CAP., 15MF 10% 35V	1	EA	FWSI	601
2C 029	301-13-10002	CAP,CR , 50V .100 UF 20%	1	EA	ERIE/MML	8131-050-651-104M
2C 030	338-14-15004	CAP., 15MF 10% 35V	1	EA	FWSI	601
2C 031	301-13-10002	CAP,CR , 50V .100 UF 20%	1	EA	ERIE/MML	8131-050-651-104M
2C 032	304-01-01509	CAP. 15PF .5PF 500V	1	EA	FWSI	600
2CR001	088-10-41480	DIODE,SW,75V/5UA,4NS/10MA	1	EA	CODI/MML	1N4148
2CR002	088-10-41480	DIODE,SW,75V/5UA,4NS/10MA	1	EA	CODI/MML	1N4148
2CR003	088-10-41480	DIODE,SW,75V/5UA,4NS/10MA	1	EA	CODI/MML	1N4148
2CR004	088-10-41480	DIODE,SW,75V/5UA,4NS/10MA	1	EA	CODI/MML	1N4148
2CR005	088-10-41480	DIODE,SW,75V/5UA,4NS/10MA	1	EA	CODI/MML	1N4148
2CR006	088-10-09361	DIODE,REF,9V/7.5MA,.005 %	1	EA	MOT/MML	1N936A/1N936B
2CR007	088-10-09642	DIODE,ZENER 0.4W 13.0V	1	EA	CODI/MML	1N964B
2CR008	088-10-41480	DIODE,SW,75V/5UA,4NS/10MA	1	EA	CODI/MML	1N4148

CONTINUED

PARTS LIST: 24637 MFR. NAME: FWSI PARENT STK. CONT. NO.: 205-89-01410

DESCRIPTION: PWA,DUAL DISCRIMINATOR STD UM: EA ECO NO.: 0400744 ENG. REV.: M*

ITEM NO.	COMPONENT STK. CONT. NO.	DESCRIPTION	QUANTITY	UM	MFR. NAME	MFR. PART/ASSY. NO.
2CR009	088-10-41480	DIODE,SW,75V/5UA,4NS/10MA	1	EA	CODI/MML	1N4148
2CR010	088-10-48290	DIODE,STABISTOR,.84-1.25V	1	EA	CODI/MML	1N4829
2CR011	088-10-48290	DIODE,STABISTOR,.84-1.25V	1	EA	CODI/MML	1N4829
2CR012	088-97-08230	DIODE,REF. 6.2V@7.5MA	1	EA	MOT/MML	1N823,A
2CR013	088-97-08230	DIODE,REF. 6.2V@7.5MA	1	EA	MOT/MML	1N823,A
2L 001	055-89-00001	L,ASSY	1	EA	FWSI	956-1306
2L 002	055-89-00001	L,ASSY	1	EA	FWSI	956-1306
2L 003	055-89-00001	L,ASSY	1	EA	FWSI	956-1306
2Q 001	263-35-00039	XSTR,NPN,MAT.PR,VBE1-VBE2	1	EA	AMPEREX	A642/S
2Q 002	263-99-00019	XSTR,NPN 2N708,15V SW,ON	1	EA	FCH/MML	2N708
2Q 003	263-97-00093	XSTR,PNP,SWITCH/AMPL,50V	1	EA	FCH/MML	2N3251
2Q 004	263-97-00093	XSTR,PNP,SWITCH/AMPL,50V	1	EA	FCH/MML	2N3251
2Q 005	263-97-00093	XSTR,PNP,SWITCH/AMPL,50V	1	EA	FCH/MML	2N3251
2Q 006	263-97-00093	XSTR,PNP,SWITCH/AMPL,50V	1	EA	FCH/MML	2N3251
2Q 007	263-10-22221	XSTR,NPN 75V,DC/UHF AMPL	1	EA	FCH/MML	2N2222A
2Q 008	263-10-22221	XSTR,NPN 75V,DC/UHF AMPL	1	EA	FCH/MML	2N2222A
2Q 009	263-97-00093	XSTR,PNP,SWITCH/AMPL,50V	1	EA	FCH/MML	2N3251
2Q 010	263-97-00093	XSTR,PNP,SWITCH/AMPL,50V	1	EA	FCH/MML	2N3251
2Q 011	263-97-23691	XSTR,NPN SW,HS VCEO 15V	1	EA	FCH/MML	2N2369A
2Q 012	263-97-23691	XSTR,NPN SW,HS VCEO 15V	1	EA	FCH/MML	2N2369A
2Q 013	263-97-23691	XSTR,NPN SW,HS VCEO 15V	1	EA	FCH/MML	2N2369A
2Q 014	263-97-23691	XSTR,NPN SW,HS VCEO 15V	1	EA	FCH/MML	2N2369A
2Q 015	263-97-23691	XSTR,NPN SW,HS VCEO 15V	1	EA	FCH/MML	2N2369A
2Q 016	263-97-23691	XSTR,NPN SW,HS VCEO 15V	1	EA	FCH/MML	2N2369A
2Q 017	263-10-22221	XSTR,NPN 75V,DC/UHF AMPL	1	EA	FCH/MML	2N2222A
2Q 018	263-10-22221	XSTR,NPN 75V,DC/UHF AMPL	1	EA	FCH/MML	2N2222A
2Q 019	263-10-29071	XSTR,PNP SW 60V,HFE 100	1	EA	FCH/MML	2N2907A
2Q 020	263-10-22221	XSTR,NPN 75V,DC/UHF AMPL	1	EA	FCH/MML	2N2222A
2R 001	616-02-51009	RES,510 OHM 5% 1/4W	1	EA	ALLEN BRAD	RC07GF511J
2R 002	608-09-42200	RES, 4.22K 1% 1/10W	1	EA	FWSI	624
2R 003	616-02-05109	RES,51 OHM 5% 1/4W	1	EA	ALLEN BRAD	RC07GF510J
2R 004	608-09-10000	RES. 1K 1% 1/10W	1	EA	FWSI	624
2R 005	616-02-12000	RES,1.2K 5% 1/4W	1	EA	ALLEN BRAD	RC07GF122J
2R 006	608-09-60400	RES, 6.04K 1% 1/10W	1	EA	FWSI	624
2R 007	616-02-10000	RES,1K 5% 1/4W	1	EA	ALLEN BRAD	RC07GF102J
2R 008	616-02-10000	RES,1K 5% 1/4W	1	EA	ALLEN BRAD	RC07GF102J
2R 009	616-02-10009	RES,100 OHM 5% 1/4W	1	EA	ALLEN BRAD	RC07GF101J
2R 010	616-02-10001	RES,10K 5% 1/4W	1	EA	ALLEN BRAD	RC07GF103J
2R 011	201-98-00146	POT,TRMR, 20 OHM 20% .5W	1	EA	BECK/MML	62PR20
2R 012	616-02-10001	RES,10K 5% 1/4W	1	EA	ALLEN BRAD	RC07GF103J
2R 013	616-02-39000	RES,3.9K 5% 1/4W	1	EA	ALLEN BRAD	RC07GF392J

CONTINUED

PARTS LIST: 24637 MFR. NAME: FWSI PARENT STK. CONT. NO.: 205-89-01410

DESCRIPTION: PWA,DUAL DISCRIMINATOR STD UM: EA ECO NO.: 0400744 ENG. REV.: M*

ITEM NO.	COMPONENT STK. CONT. NO.	DESCRIPTION	QUANTITY	UM	MFR. NAME	MFR. PART/ASSY. NO.
2R 014	616-02-20009	RES,200 OHM 5% 1/4W	1	EA	ALLEN BRAD	RC07GF201J
2R 015	616-02-20009	RES,200 OHM 5% 1/4W	1	EA	ALLEN BRAD	RC07GF201J
2R 016	608-09-43200	RES, 4.32K 1% 1/10W	1	EA	FWSI	624
2R 017	608-09-51100	RES, 5.11K 1% 1/10W	1	EA	EMR	624
2R 018	616-02-39000	RES,3.9K 5% 1/4W	1	EA	ALLEN BRAD	RC07GF392J
2R 019	616-02-12001	RES,12K 5% 1/4W	1	EA	ALLEN BRAD	RC07GF123J
2R 020	608-09-10201	RES, 10.2K 1% 1/10W	1	EA	FWSI	624
2R 021	608-09-20000	RES. 2.0K 1% 1/10W	1	EA	FWSI	624
2R 022	608-09-11800	RES, 1.18K 1% 1/10W	1	EA	FWSI	624
2R 023	616-02-10009	RES,100 OHM 5% 1/4W	1	EA	ALLEN BRAD	RC07GF101J
2R 024	608-09-20000	RES. 2.0K 1% 1/10W	1	EA	FWSI	624
2R 025	608-09-20000	RES. 2.0K 1% 1/10W	1	EA	FWSI	624
2R 026	608-09-10201	RES, 10.2K 1% 1/10W	1	EA	FWSI	624
2R 027	608-09-30100	RES. 3.01K 1% 1/10W	1	EA	FWSI	624
2R 028	616-02-10009	RES,100 OHM 5% 1/4W	1	EA	ALLEN BRAD	RC07GF101J
2R 029	608-09-10000	RES. 1K 1% 1/10W	1	EA	FWSI	624
2R 030	608-09-10000	RES. 1K 1% 1/10W	1	EA	FWSI	624
2R 031	616-02-10009	RES,100 OHM 5% 1/4W	1	EA	ALLEN BRAD	RC07GF101J
2R 032	616-02-12009	RES,120 OHM 5% 1/4W	1	EA	ALLEN BRAD	RC07GF121J
2R 033	608-09-10000	RES. 1K 1% 1/10W	1	EA	FWSI	624
2R 034	608-09-10000	RES. 1K 1% 1/10W	1	EA	FWSI	624
2R 035	616-02-12009	RES,120 OHM 5% 1/4W	1	EA	ALLEN BRAD	RC07GF121J
2R 036	608-09-10000	RES. 1K 1% 1/10W	1	EA	FWSI	624
2R 037	608-09-49909	RES, 499.0 OHM 1% 1/10W	1	EA	FWSI	624
2R 038	608-09-10000	RES. 1K 1% 1/10W	1	EA	FWSI	624
2R 039	608-09-49900	RES. 4.99K 1% 1/10W	1	EA	FWSI	624
2R 040	608-09-24300	RES, 2.43K 1% 1/10W	1	EA	FWSI	624
2R 041	608-09-00000	RES,*TVAR* 1%,1/10W	AR	EA	FWSI	624
2R 042	608-09-00000	RES,*TVAR* 1%,1/10W	AR	EA	FWSI	624
2R 043	608-09-24300	RES, 2.43K 1% 1/10W	1	EA	FWSI	624
2R 044	608-09-24300	RES, 2.43K 1% 1/10W	1	EA	FWSI	624
2R 045	608-09-63400	RES, 6.34K 1% 1/10W	1	EA	EMR	624
2R 046	201-98-00134	POT,TRMR,500 OHM 10% .5W	1	EA	BECK/MML	62PR500
2R 047	626-13-12509	RES, 125 OHM 3% 3W	1	EA	FWSI	621*125041
2R 048	608-09-10201	RES, 10.2K 1% 1/10W	1	EA	FWSI	624
2R 049	616-02-00279	RES, 2.7 OHM 5% 1/4W	1	EA	ALLEN BRAD	RC07GF2R7J
2R 050	626-13-12509	RES, 125 OHM 3% 3W	1	EA	FWSI	621*125041
2R 051	608-09-10000	RES. 1K 1% 1/10W	1	EA	FWSI	624
2R 052	608-09-10000	RES. 1K 1% 1/10W	1	EA	FWSI	624
2R 053	616-02-51000	RES,5.1K 5% 1/4W	1	EA	ALLEN BRAD	RC07GF512J
2R 054	616-02-51000	RES,5.1K 5% 1/4W	1	EA	ALLEN BRAD	RC07GF512J

CONTINUED

PARTS LIST: 24637 MFR. NAME: FWSI PARENT STK. CONT. NO.: 205-89-01410

DESCRIPTION: PWA,DUAL DISCRIMINATOR STD UM: EA ECO NO.: 0400744 ENG. REV.: M*

ITEM NO.	COMPONENT STK. CONT. NO.	DESCRIPTION	QUANTITY	UM	MFR. NAME	MFR. PART/ASSY. NO.
2R 055	608-09-30900	RES, 3.09K 1% 1/10W	1	EA	FWSI	624
2R 056	608-09-10000	RES. 1K 1% 1/10W	1	EA	FWSI	624
2R 057	608-09-49909	RES, 499.0 OHM 1% 1/10W	1	EA	FWSI	624
2R 058	608-09-18700	RES, 1.87K 1% 1/10W	1	EA	FWSI	624
2R 059	608-09-12400	RES, 1.24K 1% 1/10W	1	EA	FWSI	624
2R 060	616-02-10009	RES,100 OHM 5% 1/4W	1	EA	ALLEN BRAD	RC07GF101J
2R 061	616-02-10009	RES,100 OHM 5% 1/4W	1	EA	ALLEN BRAD	RC07GF101J
2R 062	608-09-10200	RES, 1.02K 1% 1/10W	1	EA	BMR	624
2R 063	608-09-12101	RES, 12.1K 1% 1/10W	1	EA	FWSI	624
2R 064	616-02-10009	RES,100 OHM 5% 1/4W	1	EA	ALLEN BRAD	RC07GF101J
2R 065	608-09-00000	RES,*TVAR* 1%,1/10W	AR	EA	FWSI	624
2R 066	616-02-05109	RES,51 OHM 5% 1/4W	1	EA	ALLEN BRAD	RC07GF510J
2R 067	608-09-27400	RES. 2.74K 1% 1/10W	1	EA	FWSI	624
2R 068	608-09-63409	RES, 634.0 OHM 1% 1/10W	1	EA	BMR	624
2R 069	608-09-00000	RES,*TVAR* 1%,1/10W	AR	EA	FWSI	624
2TP001	143-98-00048	JACK,TEST PT,PW TYPE,BRN	1	EA	E F JOHNSON	105-0858-001
2TP010	143-98-00010	JACK,TEST PT,PW TYPE,BLK	1	EA	E F JOHNSON	105-0853-001
2U 001	046-34-00004	IC,LIN AMPL,OPNL	1	EA	NSC/MML	LM301AH
2U 002	046-34-00022	IC,LIN AMPL,CUR DC/30MHZ	1	EA	NSC/MML	LH0002CH
2U 003	046-47-00001	IC,LIN AMPL,OPNL,COMPEN	1	EA	PMI/MICRO PR	OP-01CJ/EJ MP5501CJ/EJ
2U 004	046-34-00014	IC,LIN VOLTAGE FOLLOWER	1	EA	NSC/MML	LM310H
2U 005	046-34-00014	IC,LIN VOLTAGE FOLLOWER	1	EA	NSC/MML	LM310H
2U 006	046-47-00001	IC,LIN AMPL,OPNL,COMPEN	1	EA	PMI/MICRO PR	OP-01CJ/EJ MP5501CJ/EJ
2U 007	046-34-00023	IC,LIN RGLTR, 15V,NEG,.2A	1	EA	NSC/MML	LM320H15

END OF LIST

PARTS LIST: 24637-1 MFR. NAME: FWSI PARENT STK. CONT. NO.: 205-89-01471

DESCRIPTION: PWA,DUAL DISCRIMINATOR UM: EA ECO NO.: RC00001 ENG. REV.: L#
REFERENCE STD

ITEM NO.	COMPONENT STK. CONT. NO.	DESCRIPTION	QUANTITY	UM	MFR. NAME	MFR. PART/ASSY. NO.
001	204-89-00486	PWB,DUAL DISCRIMINATOR	1	EA	FWSI	24636-1
002	298-99-00038	HTSK,BAR	1	EA	FWSI	22855
003	298-99-00038	HTSK,BAR	4	EA	FWSI	22855
004	060-21-00002	CMPD,HEAT CONDUCTIVE GEL	AR	EA	DOW CORNING	DOW CORNING 340
005	273-98-00058	WASHER,.1091DX.2500D,MICA	4	EA	SEASTROM	5624-8-5
006	049-98-00010	CLIP,THERMAL EQUALIZING	4	EA	WAKEFIELD	259-18-25
007	298-98-00008	HTSK,FOR TO-5 PKG	1	EA	IERC/MML	TXBF-032-025B
008	189-98-00004	PAD,XSTR 4 PIN*USE OPTL*	21	EA	DEL BLINN	100-000-NY
009	189-99-00001	PAD,XSTR TO-5,9 OR 11,4 P	1	EA	FWSI	800-1
010	189-98-00011	PAD,XSTR,TO-5 8PIN,.075H	6	EA	MILTON ROSS	10193-DAP
011	276-98-00196	WIRE,JUMPER,#22 SOLID .5L	4	EA	MML42	J0.500X0.250T22
013	239-99-00125	SPACER,MOD,.250DIA X .75L	2	EA	FWSI	27564
014	273-02-00004	WASHER,#4, FLT ST STL	1	EA	PROMT OPTION	MS15795-803
015	273-02-00025	WASHER,#4,INT TOOTH	1	EA	PROMT OPTION	MS35333-70
016	229-02-00074	SCREW,4-40X5/16 PAN HD	1	EA	PROMT OPTION	MS51957-14
019	298-98-00017	HTSK TO-18 2-56 SCREW	8	EA	IERC	TXB2P-019-028B
REF001	905-01-10004	SCHEM,PWA,DUAL DISCR	AR	EA	FWSI	24635
REF002	905-04-00001	SPEC,COMPONENT SPACING	AR	EA	FWSI	9500
1J 001	065-98-00045	CONT,PIN,.025SQ, .620L	1	EA	BERG ELECT	75481-014
1J 002	065-98-00045	CONT,PIN,.025SQ, .620L	1	EA	BERG ELECT	75481-014
1J 003	065-98-00045	CONT,PIN,.025SQ, .620L	1	EA	BERG ELECT	75481-014
1J 004	065-98-00045	CONT,PIN,.025SQ, .620L	1	EA	BERG ELECT	75481-014
1J 029	065-98-00045	CONT,PIN,.025SQ, .620L	1	EA	BERG ELECT	75481-014
2C 001	301-13-10003	CAP,CR , 50V 1.00UF 20%	1	EA	ERIE/MML	8131-050-651-105M
2C 002	301-71-10001	CAP,CR,50V .01UF +80,-20%	1	EA	ERIE/MML	GP50-103ZC/TA-.01
2C 003	301-13-10002	CAP,CR , 50V .100 UF 20%	1	EA	ERIE/MML	8131-050-651-104M
2C 004	336-12-33003	CAP., 3.3MF 10% 15V	1	EA	FWSI	601
2C 005	301-13-10002	CAP,CR , 50V .100 UF 20%	1	EA	ERIE/MML	8131-050-651-104M
2C 006	304-08-03009	CAP. 30PF .5PF 500V	1	EA	FWSI	600
2C 007	301-13-10002	CAP,CR , 50V .100 UF 20%	1	EA	ERIE/MML	8131-050-651-104M
2C 008	301-13-10002	CAP,CR , 50V .100 UF 20%	1	EA	ERIE/MML	8131-050-651-104M
2C 009	301-13-10002	CAP,CR , 50V .100 UF 20%	1	EA	ERIE/MML	8131-050-651-104M
2C 010	304-13-05109	CAP. 51PF 1% 500V	1	EA	FWSI	600
2C 011	304-13-05109	CAP. 51PF 1% 500V	1	EA	FWSI	600
2C 012	301-13-10002	CAP,CR , 50V .100 UF 20%	1	EA	ERIE/MML	8131-050-651-104M
2C 013	301-13-10002	CAP,CR , 50V .100 UF 20%	1	EA	ERIE/MML	8131-050-651-104M
2C 014	304-08-02009	CAP.,20PF .5PF 500V	1	EA	FWSI	600
2C 015	301-13-10002	CAP,CR , 50V .100 UF 20%	1	EA	ERIE/MML	8131-050-651-104M
2C 016	301-13-10002	CAP,CR , 50V .100 UF 20%	1	EA	ERIE/MML	8131-050-651-104M
2C 017	301-13-10002	CAP,CR , 50V .100 UF 20%	1	EA	ERIE/MML	8131-050-651-104M
2C 018	301-13-10002	CAP,CR , 50V .100 UF 20%	1	EA	ERIE/MML	8131-050-651-104M

CONTINUED

PARTS LIST: 24637-1 MFR. NAME: FWSI PARENT STK. CONT. NO.: 205-89-01471

DESCRIPTION: PWA,DUAL DISCRIMINATOR UM: EA ECO NO.: RC00001 ENG. REV.: L#
REFERENCE STD

ITEM NO.	COMPONENT STK. CONT. NO.	DESCRIPTION	QUANTITY	UM	MFR. NAME	MFR. PART/ASSY. NO.
2C 019	301-13-10002	CAP,CR , 50V .100 UF 20%	1	EA	ERIE/MML	8131-050-651-104M
2C 020	301-13-10002	CAP,CR , 50V .100 UF 20%	1	EA	ERIE/MML	8131-050-651-104M
2C 021	337-12-22004	CAP., 22MF 10% 15V	1	EA	FWSI	601
2C 022	301-13-10002	CAP,CR , 50V .100 UF 20%	1	EA	ERIE/MML	8131-050-651-104M
2C 023	384-05-75000	CAP., 7500PF 1% 50V	1	EA	FWSI	949
2C 024	301-13-10002	CAP,CR , 50V .100 UF 20%	1	EA	ERIE/MML	8131-050-651-104M
2C 025	301-13-10002	CAP,CR , 50V .100 UF 20%	1	EA	ERIE/MML	8131-050-651-104M
2C 026	338-14-15004	CAP., 15MF 10% 35V	1	EA	FWSI	601
2C 027	336-14-10003	CAP. 1.0MF 10% 35V	1	EA	FWSI	601
2C 028	338-14-15004	CAP., 15MF 10% 35V	1	EA	FWSI	601
2C 029	301-13-10002	CAP,CR , 50V .100 UF 20%	1	EA	ERIE/MML	8131-050-651-104M
2C 030	338-14-15004	CAP., 15MF 10% 35V	1	EA	FWSI	601
2C 031	301-13-10002	CAP,CR , 50V .100 UF 20%	1	EA	ERIE/MML	8131-050-651-104M
2C 032	304-01-01509	CAP. 15PF .5PF 500V	1	EA	FWSI	600
2CR001	088-10-41480	DIODE,SW,75V/5UA,4NS/10MA	1	EA	CODI/MML	1N4148
2CR002	088-10-41480	DIODE,SW,75V/5UA,4NS/10MA	1	EA	CODI/MML	1N4148
2CR003	088-10-41480	DIODE,SW,75V/5UA,4NS/10MA	1	EA	CODI/MML	1N4148
2CR004	088-10-41480	DIODE,SW,75V/5UA,4NS/10MA	1	EA	CODI/MML	1N4148
2CR005	088-10-41480	DIODE,SW,75V/5UA,4NS/10MA	1	EA	CODI/MML	1N4148
2CR006	088-10-09361	DIODE,REF,9V/7.5MA,.005 %	1	EA	MOT/MML	1N936A/1N936B
2CR007	088-10-09642	DIODE,ZENER 0.4W 13.0V	1	EA	CODI/MML	1N964B
2CR008	088-10-41480	DIODE,SW,75V/5UA,4NS/10MA	1	EA	CODI/MML	1N4148
2CR009	088-10-41480	DIODE,SW,75V/5UA,4NS/10MA	1	EA	CODI/MML	1N4148
2CR010	088-10-48290	DIODE,STABISTOR,.84-1.25V	1	EA	CODI/MML	1N4829
2CR011	088-10-48290	DIODE,STABISTOR,.84-1.25V	1	EA	CODI/MML	1N4829
2CR012	088-97-08230	DIODE,REF. 6.2V@7.5MA	1	EA	MOT/MML	1N823,A
2CR013	088-97-08230	DIODE,REF. 6.2V@7.5MA	1	EA	MOT/MML	1N823,A
2J 001	065-98-00045	CONT,PIN,.025SQ, .620L	1	EA	BERG ELECT	75481-014
2J 002	065-98-00045	CONT,PIN,.025SQ, .620L	1	EA	BERG ELECT	75481-014
2J 003	065-98-00045	CONT,PIN,.025SQ, .620L	1	EA	BERG ELECT	75481-014
2J 004	065-98-00045	CONT,PIN,.025SQ, .620L	1	EA	BERG ELECT	75481-014
2J 005	065-98-00045	CONT,PIN,.025SQ, .620L	1	EA	BERG ELECT	75481-014
2J 006	065-98-00045	CONT,PIN,.025SQ, .620L	1	EA	BERG ELECT	75481-014
2J 007	065-98-00045	CONT,PIN,.025SQ, .620L	1	EA	BERG ELECT	75481-014
2J 008	065-98-00045	CONT,PIN,.025SQ, .620L	1	EA	BERG ELECT	75481-014
2J 009	065-98-00045	CONT,PIN,.025SQ, .620L	1	EA	BERG ELECT	75481-014
2J 010	065-98-00045	CONT,PIN,.025SQ, .620L	1	EA	BERG ELECT	75481-014
2J 011	065-98-00045	CONT,PIN,.025SQ, .620L	1	EA	BERG ELECT	75481-014
2J 012	065-98-00045	CONT,PIN,.025SQ, .620L	1	EA	BERG ELECT	75481-014
2J 013	065-98-00045	CONT,PIN,.025SQ, .620L	1	EA	BERG ELECT	75481-014
2J 014	065-98-00045	CONT,PIN,.025SQ, .620L	1	EA	BERG ELECT	75481-014

CONTINUED

PARTS LIST: 24637-1 MFR. NAME: FWSI PARENT STK. CONT. NO.: 205-89-01471

DESCRIPTION: PWA,DUAL DISCRIMINATOR UM: EA ECO NO.: RC00001 ENG. REV.: L#
REFERENCE STD

ITEM NO.	COMPONENT STK. CONT. NO.	DESCRIPTION	QUANTITY	UM	MFR. NAME	MFR. PART/ASSY. NO.
2J 015	065-98-00045	CONT,PIN,.025SQ, .620L	1	EA	BERG ELECT	75481-014
2J 016	065-98-00045	CONT,PIN,.025SQ, .620L	1	EA	BERG ELECT	75481-014
2J 017	065-98-00045	CONT,PIN,.025SQ, .620L	1	EA	BERG ELECT	75481-014
2J 018	065-98-00045	CONT,PIN,.025SQ, .620L	1	EA	BERG ELECT	75481-014
2J 019	065-98-00045	CONT,PIN,.025SQ, .620L	1	EA	BERG ELECT	75481-014
2J 020	065-98-00045	CONT,PIN,.025SQ, .620L	1	EA	BERG ELECT	75481-014
2J 021	065-98-00045	CONT,PIN,.025SQ, .620L	1	EA	BERG ELECT	75481-014
2J 022	065-98-00045	CONT,PIN,.025SQ, .620L	1	EA	BERG ELECT	75481-014
2J 023	065-98-00045	CONT,PIN,.025SQ, .620L	1	EA	BERG ELECT	75481-014
2J 024	065-98-00045	CONT,PIN,.025SQ, .620L	1	EA	BERG ELECT	75481-014
2J 025	065-98-00045	CONT,PIN,.025SQ, .620L	1	EA	BERG ELECT	75481-014
2J 026	065-98-00045	CONT,PIN,.025SQ, .620L	1	EA	BERG ELECT	75481-014
2J 027	065-98-00045	CONT,PIN,.025SQ, .620L	1	EA	BERG ELECT	75481-014
2J 028	065-98-00045	CONT,PIN,.025SQ, .620L	1	EA	BERG ELECT	75481-014
2J 029	065-98-00045	CONT,PIN,.025SQ, .620L	1	EA	BERG ELECT	75481-014
2L 001	055-89-00001	L,ASSY	1	EA	FWSI	956-1306
2L 002	055-89-00001	L,ASSY	1	EA	FWSI	956-1306
2L 003	055-89-00001	L,ASSY	1	EA	FWSI	956-1306
2Q 001	263-35-00039	XSTR,NPN,MAT.PR,VBE1-VBE2	1	EA	AMPEREX	A642/S
2Q 002	263-99-00019	XSTR,NPN 2N708,15V SW,ON	1	EA	FCH/MML	2N708
2Q 003	263-97-00093	XSTR,PNP,SWITCH/AMPL,50V	1	EA	FCH/MML	2N3251
2Q 004	263-97-00093	XSTR,PNP,SWITCH/AMPL,50V	1	EA	FCH/MML	2N3251
2Q 005	263-97-00093	XSTR,PNP,SWITCH/AMPL,50V	1	EA	FCH/MML	2N3251
2Q 006	263-97-00093	XSTR,PNP,SWITCH/AMPL,50V	1	EA	FCH/MML	2N3251
2Q 007	263-10-22221	XSTR,NPN 75V,DC/UHF AMPL	1	EA	FCH/MML	2N2222A
2Q 008	263-10-22221	XSTR,NPN 75V,DC/UHF AMPL	1	EA	FCH/MML	2N2222A
2Q 009	263-97-00093	XSTR,PNP,SWITCH/AMPL,50V	1	EA	FCH/MML	2N3251
2Q 010	263-97-00093	XSTR,PNP,SWITCH/AMPL,50V	1	EA	FCH/MML	2N3251
2Q 011	263-97-23691	XSTR,NPN SW,HS VCEO 15V	1	EA	FCH/MML	2N2369A
2Q 012	263-97-23691	XSTR,NPN SW,HS VCEO 15V	1	EA	FCH/MML	2N2369A
2Q 013	263-97-23691	XSTR,NPN SW,HS VCEO 15V	1	EA	FCH/MML	2N2369A
2Q 014	263-97-23691	XSTR,NPN SW,HS VCEO 15V	1	EA	FCH/MML	2N2369A
2Q 015	263-97-23691	XSTR,NPN SW,HS VCEO 15V	1	EA	FCH/MML	2N2369A
2Q 016	263-97-23691	XSTR,NPN SW,HS VCEO 15V	1	EA	FCH/MML	2N2369A
2Q 017	263-10-22221	XSTR,NPN 75V,DC/UHF AMPL	1	EA	FCH/MML	2N2222A
2Q 018	263-10-22221	XSTR,NPN 75V,DC/UHF AMPL	1	EA	FCH/MML	2N2222A
2Q 019	263-10-29071	XSTR,PNP SW 60V,HFE 100	1	EA	FCH/MML	2N2907A
2Q 020	263-10-22221	XSTR,NPN 75V,DC/UHF AMPL	1	EA	FCH/MML	2N2222A
2R 001	616-02-51009	RES,510 OHM 5% 1/4W	1	EA	ALLEN BRAD	RC07GF511J
2R 002	608-09-42200	RES, 4.22K 1% 1/10W	1	EA	FWSI	624
2R 003	616-02-05109	RES,51 OHM 5% 1/4W	1	EA	ALLEN BRAD	RC07GF510J

CONTINUED

PARTS LIST: 24637-1 MFR. NAME: FWSI PARENT STK. CONT. NO.: 205-89-01471

DESCRIPTION: PWA,DUAL DISCRIMINATOR UM: EA ECO NO.: RC00001 ENG. REV.: L#
REFERENCE STD

ITEM NO.	COMPONENT STK. CONT. NO.	DESCRIPTION	QUANTITY	UM	MFR. NAME	MFR. PART/ASSY. NO.
2R 004	608-09-10000	RES. 1K 1% 1/10W	1	EA	FWSI	624
2R 005	616-02-12000	RES,1.2K 5% 1/4W	1	EA	ALLEN BRAD	RC07GF122J
2R 006	608-09-60400	RES, 6.04K 1% 1/10W	1	EA	FWSI	624
2R 007	616-02-10000	RES,1K 5% 1/4W	1	EA	ALLEN BRAD	RC07GF102J
2R 008	616-02-10000	RES,1K 5% 1/4W	1	EA	ALLEN BRAD	RC07GF102J
2R 009	616-02-10009	RES,100 OHM 5% 1/4W	1	EA	ALLEN BRAD	RC07GF101J
2R 010	616-02-10001	RES,10K 5% 1/4W	1	EA	ALLEN BRAD	RC07GF103J
2R 011	201-98-00146	POT,TRMR, 20 OHM 20% .5W	1	EA	BECK/MML	62PR20
2R 012	616-02-10001	RES,10K 5% 1/4W	1	EA	ALLEN BRAD	RC07GF103J
2R 013	616-02-39000	RES,3.9K 5% 1/4W	1	EA	ALLEN BRAD	RC07GF392J
2R 014	616-02-20009	RES,200 OHM 5% 1/4W	1	EA	ALLEN BRAD	RC07GF201J
2R 015	616-02-20009	RES,200 OHM 5% 1/4W	1	EA	ALLEN BRAD	RC07GF201J
2R 016	608-09-43200	RES, 4.32K 1% 1/10W	1	EA	FWSI	624
2R 017	608-09-51100	RES, 5.11K 1% 1/10W	1	EA	EMR	624
2R 018	616-02-39000	RES,3.9K 5% 1/4W	1	EA	ALLEN BRAD	RC07GF392J
2R 019	616-02-12001	RES,12K 5% 1/4W	1	EA	ALLEN BRAD	RC07GF123J
2R 020	608-09-10201	RES, 10.2K 1% 1/10W	1	EA	FWSI	624
2R 021	608-09-20000	RES. 2.0K 1% 1/10W	1	EA	FWSI	624
2R 022	608-09-11800	RES, 1.18K 1% 1/10W	1	EA	FWSI	624
2R 023	616-02-10009	RES,100 OHM 5% 1/4W	1	EA	ALLEN BRAD	RC07GF101J
2R 024	608-09-20000	RES. 2.0K 1% 1/10W	1	EA	FWSI	624
2R 025	608-09-20000	RES. 2.0K 1% 1/10W	1	EA	FWSI	624
2R 026	608-09-10201	RES, 10.2K 1% 1/10W	1	EA	FWSI	624
2R 027	608-09-30100	RES. 3.01K 1% 1/10W	1	EA	FWSI	624
2R 028	616-02-10009	RES,100 OHM 5% 1/4W	1	EA	ALLEN BRAD	RC07GF101J
2R 029	608-09-10000	RES. 1K 1% 1/10W	1	EA	FWSI	624
2R 030	608-09-10000	RES. 1K 1% 1/10W	1	EA	FWSI	624
2R 031	616-02-10009	RES,100 OHM 5% 1/4W	1	EA	ALLEN BRAD	RC07GF101J
2R 032	616-02-12009	RES,120 OHM 5% 1/4W	1	EA	ALLEN BRAD	RC07GF121J
2R 033	608-09-10000	RES. 1K 1% 1/10W	1	EA	FWSI	624
2R 034	608-09-10000	RES. 1K 1% 1/10W	1	EA	FWSI	624
2R 035	616-02-12009	RES,120 OHM 5% 1/4W	1	EA	ALLEN BRAD	RC07GF121J
2R 036	608-09-10000	RES. 1K 1% 1/10W	1	EA	FWSI	624
2R 037	608-09-49909	RES, 499.0 OHM 1% 1/10W	1	EA	FWSI	624
2R 038	608-09-10000	RES. 1K 1% 1/10W	1	EA	FWSI	624
2R 039	608-09-49900	RES. 4.99K 1% 1/10W	1	EA	FWSI	624
2R 040	608-09-24300	RES, 2.43K 1% 1/10W	1	EA	FWSI	624
2R 041	608-09-00000	RES,*TVAR* 1%,1/10W	AR	EA	FWSI	624
2R 042	608-09-00000	RES,*TVAR* 1%,1/10W	AR	EA	FWSI	624
2R 043	608-09-24300	RES, 2.43K 1% 1/10W	1	EA	FWSI	624
2R 044	608-09-24300	RES, 2.43K 1% 1/10W	1	EA	FWSI	624

CONTINUED

PARTS LIST: 24637-1 MFR. NAME: FWSI PARENT STK. CONT. NO.: 205-89-01471

DESCRIPTION: PWA,DUAL DISCRIMINATOR UM: EA ECO NO.: RC00001 ENG. REV.: L#
REFERENCE STD

ITEM NO.	COMPONENT STK. CONT. NO.	DESCRIPTION	QUANTITY	UM	MFR. NAME	MFR. PART/ASSY. NO.
2R 045	608-09-63400	RES, 6.34K 1% 1/10W	1	EA	EMR	624
2R 046	201-98-00134	POT,TRMR,500 OHM 10% .5W	1	EA	BECK/MML	62PR500
2R 047	626-13-12509	RES, 125 OHM 3% 3W	1	EA	FWSI	621*125041
2R 048	608-09-10201	RES, 10.2K 1% 1/10W	1	EA	FWSI	624
2R 049	616-02-00279	RES, 2.7 OHM 5% 1/4W	1	EA	ALLEN BRAD	RC07GF2R7J
2R 050	626-13-12509	RES, 125 OHM 3% 3W	1	EA	FWSI	621*125041
2R 051	608-09-10000	RES. 1K 1% 1/10W	1	EA	FWSI	624
2R 052	608-09-10000	RES. 1K 1% 1/10W	1	EA	FWSI	624
2R 053	616-02-51000	RES,5.1K 5% 1/4W	1	EA	ALLEN BRAD	RC07GF512J
2R 054	616-02-51000	RES,5.1K 5% 1/4W	1	EA	ALLEN BRAD	RC07GF512J
2R 055	608-09-30900	RES, 3.09K 1% 1/10W	1	EA	FWSI	624
2R 056	608-09-10000	RES. 1K 1% 1/10W	1	EA	FWSI	624
2R 057	608-09-49909	RES, 499.0 OHM 1% 1/10W	1	EA	FWSI	624
2R 058	608-09-18700	RES, 1.87K 1% 1/10W	1	EA	FWSI	624
2R 059	608-09-12400	RES, 1.24K 1% 1/10W	1	EA	FWSI	624
2R 060	616-02-10009	RES,100 OHM 5% 1/4W	1	EA	ALLEN BRAD	RC07GF101J
2R 061	616-02-10009	RES,100 OHM 5% 1/4W	1	EA	ALLEN BRAD	RC07GF101J
2R 062	608-09-10200	RES, 1.02K 1% 1/10W	1	EA	EMR	624
2R 063	608-09-12101	RES, 12.1K 1% 1/10W	1	EA	FWSI	624
2R 064	616-02-10009	RES,100 OHM 5% 1/4W	1	EA	ALLEN BRAD	RC07GF101J
2R 065	608-09-00000	RES,*TVAR* 1%,1/10W	AR	EA	FWSI	624
2R 066	616-02-05109	RES,51 OHM 5% 1/4W	1	EA	ALLEN BRAD	RC07GF510J
2R 067	608-09-27400	RES. 2.74K 1% 1/10W	1	EA	FWSI	624
2R 068	608-09-63409	RES, 634.0 OHM 1% 1/10W	1	EA	EMR	624
2R 069	608-09-00000	RES,*TVAR* 1%,1/10W	AR	EA	FWSI	624
2TP001	143-98-00048	JACK,TEST PT,PW TYPE,BRN	1	EA	E F JOHNSON	105-0858-001
2TP010	143-98-00010	JACK,TEST PT,PW TYPE,BLK	1	EA	E F JOHNSON	105-0853-001
2U 001	046-34-00004	IC,LIN AMPL,OPNL	1	EA	NSC/MML	LM301AH
2U 002	046-34-00022	IC,LIN AMPL,CUR DC/30MHZ	1	EA	NSC/MML	LH0002CH
2U 003	046-47-00001	IC,LIN AMPL,OPNL,COMPEN	1	EA	PMI/MICRO PR	OP-01CJ/EJ MP5501CJ/EJ
2U 004	046-34-00014	IC,LIN VOLTAGE FOLLOWER	1	EA	NSC/MML	LM310H
2U 005	046-34-00014	IC,LIN VOLTAGE FOLLOWER	1	EA	NSC/MML	LM310H
2U 006	046-47-00001	IC,LIN AMPL,OPNL,COMPEN	1	EA	PMI/MICRO PR	OP-01CJ/EJ MP5501CJ/EJ
2U 007	046-34-00023	IC,LIN RGLTR, 15V,NEG,.2A	1	EA	NSC/MML	LM320H15

END OF LIST

PARTS LIST: 24640 MFR. NAME: FWSI PARENT STK. CONT. NO.: 205-89-01411

DESCRIPTION: PWA,CHANNEL SELECTOR STD UM: EA ECO NO.: RC00001 ENG. REV.: C#

ITEM NO.	COMPONENT STK. CONT. NO.	DESCRIPTION	QUANTITY	UM	MFR. NAME	MFR. PART/ASSY. NO.
001	204-89-00473	PWB,CHANNEL SELECTOR	1	EA	FWSI	24639
002	189-99-00003	PAD,XSTR 4 PIN	3	EA	FWSI	800-7
003	232-99-00077	SHIELD,CHAN SEL,1.65X5.17	1	EA	FWSI	24792
004	229-02-00235	SCREW,4-40X3/16,100FLT HD	2	EA	QVL	MS24693-C1
005	196-99-00239	PLATE,NAME EQUIP IDENT	1	EA	FWSI	10663-2
006	268-98-00001	TBG, 1/4 ,THERMO-FIT,WHT	0.5FT		RACHEM/MML	RNF-100-1/4-WHT
007	239-99-00126	SPACER,MOD,5/8LG,1/16 PNL	2	EA	FWSI	27564-1
008	999-01-00310	RES,*F/VAR*	AR	EA	FWSI	24658
C 001	301-13-10003	CAP,CR , 50V 1.00UF 20%	1	EA	ERIE/MML	8131-050-651-105M
C 002	999-01-00305	CAP,*F/VAR*	AR	EA	FWSI	24658
C 003	999-01-00303	CAP,*F/VAR*	AR	EA	FWSI	24658
C 004	999-01-00304	CAP,*F/VAR*	AR	EA	FWSI	24658
C 005	999-01-00306	CAP,*F/VAR*	AR	EA	FWSI	24658
C 006	999-01-00312	CAP,*F/VAR*	AR	EA	FWSI	25196
C 007	999-01-00313	CAP,*F/VAR*	AR	EA	FWSI	25196
C 008	999-01-00314	CAP,*F/VAR*	AR	EA	FWSI	25196
C 009	999-01-00315	CAP,*F/VAR*	AR	EA	FWSI	25196
C 010	999-01-00316	CAP,*F/VAR*	AR	EA	FWSI	25196
C 011	999-01-00317	CAP,*F/VAR*	AR	EA	FWSI	25196
C 012	999-01-00318	CAP,*F/VAR*	AR	EA	FWSI	25196
C 014	999-01-00319	CAP,*F/VAR*	AR	EA	FWSI	25196
C 015	301-13-10002	CAP,CR , 50V .100 UF 20%	1	EA	ERIE/MML	8131-050-651-104M
C 016	301-13-10002	CAP,CR , 50V .100 UF 20%	1	EA	ERIE/MML	8131-050-651-104M
CR001	088-10-41480	DIODE,SW,75V/5UA,4NS/10MA	1	EA	CODI/MML	1N4148
CR002	088-10-41480	DIODE,SW,75V/5UA,4NS/10MA	1	EA	CODI/MML	1N4148
L 001	999-01-00307	L,*F/VAR*	AR	EA	FWSI	24658
L 002	999-01-00308	L,*F/VAR*	AR	EA	FWSI	24658
L 003	999-01-00309	L,*F/VAR*	AR	EA	FWSI	24658
P 001	065-98-00012	CONT,PCB MOUNT RECEPTACLE	1	EA	AMP	85861-4
P 002	065-98-00012	CONT,PCB MOUNT RECEPTACLE	1	EA	AMP	85861-4
P 003	065-98-00012	CONT,PCB MOUNT RECEPTACLE	1	EA	AMP	85861-4
P 004	065-98-00012	CONT,PCB MOUNT RECEPTACLE	1	EA	AMP	85861-4
P 005	065-98-00012	CONT,PCB MOUNT RECEPTACLE	1	EA	AMP	85861-4
P 006	065-98-00012	CONT,PCB MOUNT RECEPTACLE	1	EA	AMP	85861-4
P 007	065-98-00012	CONT,PCB MOUNT RECEPTACLE	1	EA	AMP	85861-4
P 008	065-98-00012	CONT,PCB MOUNT RECEPTACLE	1	EA	AMP	85861-4
P 009	065-98-00012	CONT,PCB MOUNT RECEPTACLE	1	EA	AMP	85861-4
P 010	065-98-00012	CONT,PCB MOUNT RECEPTACLE	1	EA	AMP	85861-4
P 011	065-98-00012	CONT,PCB MOUNT RECEPTACLE	1	EA	AMP	85861-4
P 012	065-98-00012	CONT,PCB MOUNT RECEPTACLE	1	EA	AMP	85861-4
P 013	065-98-00012	CONT,PCB MOUNT RECEPTACLE	1	EA	AMP	85861-4

CONTINUED

PARTS LIST: 24640 MFR. NAME: FWSI PARENT STK. CONT. NO.: 205-89-01411

DESCRIPTION: PWA,CHANNEL SELECTOR STD UM: EA ECO NO.: RC00001 ENG. REV.: C#

ITEM NO.	COMPONENT STK. CONT. NO.	DESCRIPTION	QUANTITY	UM	MFR. NAME	MFR. PART/ASSY. NO.
P 014	065-98-00012	CONT,PCB MOUNT RECEPTACLE	1	EA	AMP	85861-4
P 015	065-98-00012	CONT,PCB MOUNT RECEPTACLE	1	EA	AMP	85861-4
P 016	065-98-00012	CONT,PCB MOUNT RECEPTACLE	1	EA	AMP	85861-4
P 017	065-98-00012	CONT,PCB MOUNT RECEPTACLE	1	EA	AMP	85861-4
P 018	065-98-00012	CONT,PCB MOUNT RECEPTACLE	1	EA	AMP	85861-4
P 019	065-98-00012	CONT,PCB MOUNT RECEPTACLE	1	EA	AMP	85861-4
P 020	065-98-00012	CONT,PCB MOUNT RECEPTACLE	1	EA	AMP	85861-4
Q 001	263-10-22221	XSTR,NPN 75V,DC/UHF AMPL	1	EA	FCH/MML	2N2222A
Q 002	263-10-22221	XSTR,NPN 75V,DC/UHF AMPL	1	EA	FCH/MML	2N2222A
Q 003	263-10-22221	XSTR,NPN 75V,DC/UHF AMPL	1	EA	FCH/MML	2N2222A
R 001	616-02-10009	RES,100 OHM 5% 1/4W	1	EA	ALLEN BRAD	RC07GF101J
R 002	616-02-10009	RES,100 OHM 5% 1/4W	1	EA	ALLEN BRAD	RC07GF101J
R 003	616-02-51009	RES,510 OHM 5% 1/4W	1	EA	ALLEN BRAD	RC07GF511J
R 004	616-02-47009	RES,470 OHM 5% 1/4W	1	EA	ALLEN BRAD	RC07GF471J
R 005	616-02-20009	RES,200 OHM 5% 1/4W	1	EA	ALLEN BRAD	RC07GF201J
R 006	616-02-47009	RES,470 OHM 5% 1/4W	1	EA	ALLEN BRAD	RC07GF471J
R 007	616-02-10000	RES,1K 5% 1/4W	1	EA	ALLEN BRAD	RC07GF102J
R 009	616-02-12002	RES,120K 5% 1/4W	1	EA	ALLEN BRAD	RC07GF124J
R 010	616-02-20000	RES,2K 5% 1/4W	1	EA	ALLEN BRAD	RC07GF202J
R 011	999-01-00311	RES,*F/VAR*	AR	EA	FWSI	24658
R 012	616-02-36000	RES,3.6K 5% 1/4W	1	EA	ALLEN BRAD	RC07GF362J
R 013	999-01-00320	RES,*F/VAR*	AR	EA	FWSI	25196
R 014	999-01-00321	RES,*F/VAR*	AR	EA	FWSI	25196
R 015	999-01-00322	RES,*F/VAR*	AR	EA	FWSI	25196
R 016	999-01-00323	RES,*F/VAR*	AR	EA	FWSI	25196
R 017	999-01-00324	RES,*F/VAR*	AR	EA	FWSI	25196
R 018	999-01-00325	RES,*F/VAR*	AR	EA	FWSI	25196
R 019	999-01-00326	RES,*F/VAR*	AR	EA	FWSI	25196
R 020	999-01-00327	RES,*F/VAR*	AR	EA	FWSI	25196
R 021	999-01-00328	RES,*F/VAR*	AR	EA	FWSI	25196
R 022	616-02-00000	RES,*TVAR*	AR	EA	FWSI	00000
REF001	905-01-10005	SCHEM,PWA,CHANNEL SEL	AR	EA	FWSI	24638
REF002	905-05-00318	VAR CHART,CHAN SEL,BP	AR	EA	FWSI	24658
REF003	905-04-00001	SPEC,COMPONENT SPACING	AR	EA	FWSI	9500
REF004	905-05-00350	VAR CHART,CHAN SEL,TMG	AR	EA	FWSI	25196
REF005	204-89-00473	PWB,CHANNEL SELECTOR	AR	EA	FWSI	24639

END OF LIST

DATE 07/18/84 FAIRCHILD WESTON INC. CODE IDENT. 06141 PAGE 1

PARTS LIST: 24643 MFR. NAME: FWSI PARENT STK. CONT. NO.: 205-89-01412

DESCRIPTION: PWA,LPOF UM: EA ECO NO.: RC00001 ENG. REV.: B*

STD

ITEM NO.	COMPONENT STK. CONT. NO.	DESCRIPTION	QUANTITY	UM	MFR. NAME	MFR. PART/ASSY. NO.
001	204-99-00953	PWB,LPOF	1	EA	FWSI	24642
002	232-99-00076	SHIELD,LPOF,1.65X2.40	1	EA	FWSI	24793
003	229-98-00095	SCREW,SHEET METAL,#4,1/4L	2	EA	PROMT OPTION	BY DESCRIPTION
004	276-99-00008	WIRE,#22,BUSS,SOLID	1	FT	FWSI	619-22
005	196-99-00239	PLATE,NAME EQUIP IDENT	1	EA	FWSI	10663-2
006	255-98-00129	TERM,STDF,NON-INSUL,SWAGE	2	EA	CTC/MML	140-2089-02-05-00
007	297-98-00108	STDF,RND, .500L,.250DIA	1	EA	MML 10	350-1248-13-07/MML 10
C 001	999-01-01869	CAP,*FREQ/VAR*	AR	EA	FWSI	24659
C 002	999-01-01870	CAP,*FREQ/VAR*	AR	EA	FWSI	24659
C 003	999-01-01871	CAP,*FREQ/VAR*	AR	EA	FWSI	24659
C 004	999-01-01872	CAP,*FREQ/VAR*	AR	EA	FWSI	24659
C 005	999-01-01873	CAP,*FREQ/VAR*	AR	EA	FWSI	24659
C 006	999-01-01874	CAP,*FREQ/VAR*	AR	EA	FWSI	24659
C 007	999-01-01875	CAP,*FREQ/VAR*	AR	EA	FWSI	24659
C 008	999-01-01876	CAP,*FREQ/VAR*	AR	EA	FWSI	24659
C 009	999-01-01877	CAP,*FREQ/VAR*	AR	EA	FWSI	24659
C 010	999-01-01878	CAP,*FREQ/VAR*	AR	EA	FWSI	24659
C 011	999-01-01879	CAP,*FREQ/VAR*	AR	EA	FWSI	24659
C 012	999-01-01880	CAP,*FREQ/VAR*	AR	EA	FWSI	24659
C 013	999-01-01881	CAP,*FREQ/VAR*	AR	EA	FWSI	24659
C 014	999-01-01882	CAP,*FREQ/VAR*	AR	EA	FWSI	24659
P 021	065-98-00012	CONT,PCB MOUNT RECEPTACLE	1	EA	AMP	85861-4
P 022	065-98-00012	CONT,PCB MOUNT RECEPTACLE	1	EA	AMP	85861-4
P 023	065-98-00012	CONT,PCB MOUNT RECEPTACLE	1	EA	AMP	85861-4
P 024	065-98-00012	CONT,PCB MOUNT RECEPTACLE	1	EA	AMP	85861-4
P 025	065-98-00012	CONT,PCB MOUNT RECEPTACLE	1	EA	AMP	85861-4
P 026	065-98-00012	CONT,PCB MOUNT RECEPTACLE	1	EA	AMP	85861-4
P 027	065-98-00012	CONT,PCB MOUNT RECEPTACLE	1	EA	AMP	85861-4
P 028	065-98-00012	CONT,PCB MOUNT RECEPTACLE	1	EA	AMP	85861-4
P 029	065-98-00012	CONT,PCB MOUNT RECEPTACLE	1	EA	AMP	85861-4
R 001	999-01-01883	RES,*FREQ/VAR*	AR	EA	FWSI	24659
R 002	999-01-01884	RES,*FREQ/VAR*	AR	EA	FWSI	24659
R 003	999-01-01885	RES,*FREQ/VAR*	AR	EA	FWSI	24659
R 004	999-01-01886	RES,*FREQ/VAR*	AR	EA	FWSI	24659
R 005	999-01-01887	RES,*FREQ/VAR*	AR	EA	FWSI	24659
REF001	905-01-10006	SCHEM,PWA,LPOF	AR	EA	FWSI	24641
REF002	905-05-00319	VARIABLE CHART,LPOF	AR	EA	FWSI	24659
REF003	905-04-00001	SPEC,COMPONENT SPACING	AR	EA	FWSI	9500

END OF LIST

PARTS LIST: 24992 MFR. NAME: FWSI PARENT STK. CONT. NO.: 205-89-01413

DESCRIPTION: PWA,DELAY LINE UM: EA ECO NO.: RCD CHG ENG. REV.: AA

ITEM NO.	COMPONENT STK. CONT. NO.	DESCRIPTION	QUANTITY	UM	MFR. NAME	MFR. PART/ASSY. NO.
001	204-89-00475	PWB,DELAY LINE	1	EA	FWSI	24991
002	189-98-00004	PAD,XSTR 4 PIN*USE OPTL*	4	EA	DEL BLINN	100-000-NY
003	232-99-00078	SHIELD,DLY LINE,2.75X3.94	1	EA	FWSI	24706
004	229-98-00140	SCREW,#4-40 TAPPING 5/8L	2	EA	PROMT OPTION	FXS/8L*BY DESCRIPTION*
005	140-99-00170	INSUL,.50X2.25X.01 THK	1	EA	FWSI	21968-26
C 001	999-01-01809	CAP,*FREQ/VAR*	AR	EA	FWSI	24344
C 002	999-01-01810	CAP,*FREQ/VAR*	AR	EA	FWSI	24344
C 003	999-01-01811	CAP,*FREQ/VAR*	AR	EA	FWSI	24344
C 004	999-01-01812	CAP,*FREQ/VAR*	AR	EA	FWSI	24344
C 005	999-01-01813	CAP,*FREQ/VAR*	AR	EA	FWSI	24344
C 006	999-01-01814	CAP,*FREQ/VAR*	AR	EA	FWSI	24344
C 007	999-01-01815	CAP,*FREQ/VAR*	AR	EA	FWSI	24344
C 008	999-01-01816	CAP,*FREQ/VAR*	AR	EA	FWSI	24344
C 009	999-01-01817	CAP,*FREQ/VAR*	AR	EA	FWSI	24344
C 010	999-01-01818	CAP,*FREQ/VAR*	AR	EA	FWSI	24344
C 011	999-01-01819	CAP,*FREQ/VAR*	AR	EA	FWSI	24344
C 012	999-01-01820	CAP,*FREQ/VAR*	AR	EA	FWSI	24344
C 013	999-01-01821	CAP,*FREQ/VAR*	AR	EA	FWSI	24344
C 014	999-01-01822	CAP,*FREQ/VAR*	AR	EA	FWSI	24344
C 015	999-01-01823	CAP,*FREQ/VAR*	AR	EA	FWSI	24344
C 016	999-01-01824	CAP,*FREQ/VAR*	AR	EA	FWSI	24344
C 017	999-01-01825	CAP,*FREQ/VAR*	AR	EA	FWSI	24344
C 018	999-01-01826	CAP,*FREQ/VAR*	AR	EA	FWSI	24344
C 019	999-01-01827	CAP,*FREQ/VAR*	AR	EA	FWSI	24344
C 020	999-01-01828	CAP,*FREQ/VAR*	AR	EA	FWSI	24344
C 021	999-01-01829	CAP,*FREQ/VAR*	AR	EA	FWSI	24344
C 022	999-01-01830	CAP,*FREQ/VAR*	AR	EA	FWSI	24344
C 023	999-01-01831	CAP,*FREQ/VAR*	AR	EA	FWSI	24344
C 024	999-01-01832	CAP,*FREQ/VAR*	AR	EA	FWSI	24344
C 025	999-01-01833	CAP,*FREQ/VAR*	AR	EA	FWSI	24344
C 026	999-01-01834	CAP,*FREQ/VAR*	AR	EA	FWSI	24344
C 027	999-01-01835	CAP,*FREQ/VAR*	AR	EA	FWSI	24344
C 028	999-01-01836	CAP,*FREQ/VAR*	AR	EA	FWSI	24344
C 029	301-71-10001	CAP,CR,50V .01UF +80,-20%	1	EA	ERIE/MML	GP50-103ZC/TA-.01
C 030	301-71-10001	CAP,CR,50V .01UF +80,-20%	1	EA	ERIE/MML	GP50-103ZC/TA-.01
C 031	301-71-10001	CAP,CR,50V .01UF +80,-20%	1	EA	ERIE/MML	GP50-103ZC/TA-.01
C 032	301-71-10001	CAP,CR,50V .01UF +80,-20%	1	EA	ERIE/MML	GP50-103ZC/TA-.01
CR001	088-10-41480	DIODE,SW,75V/5UA,4NS/10MA	1	EA	CODI/MML	1N4148
CR002	088-10-41480	DIODE,SW,75V/5UA,4NS/10MA	1	EA	CODI/MML	1N4148
L 001	999-01-01837	L,*FREQ/VAR*	AR	EA	FWSI	24344
L 002	999-01-01838	L,*FREQ/VAR*	AR	EA	FWSI	24344

CONTINUED

PARTS LIST: 24992 MFR. NAME: FWSI PARENT STK. CONT. NO.: 205-89-01413

DESCRIPTION: PWA,DELAY LINE UM: EA ECO NO.: RCD CHG ENG. REV.: AA

ITEM NO.	COMPONENT STK. CONT. NO.	DESCRIPTION	QUANTITY	UM	MFR. NAME	MFR. PART/ASSY. NO.
L 003	999-01-01840	L,*FREQ/VAR*	AR	EA	FWSI	24344
L 004	999-01-01841	L,*FREQ/VAR*	AR	EA	FWSI	24344
L 005	999-01-01842	L,*FREQ/VAR*	AR	EA	FWSI	24344
L 006	999-01-01843	L,*FREQ/VAR*	AR	EA	FWSI	24344
L 007	999-01-01844	L,*FREQ/VAR*	AR	EA	FWSI	24344
L 008	999-01-01845	L,*FREQ/VAR*	AR	EA	FWSI	24344
L 009	999-01-01846	L,*FREQ/VAR*	AR	EA	FWSI	24344
L 010	999-01-01847	L,*FREQ/VAR*	AR	EA	FWSI	24344
L 011	999-01-01848	L,*FREQ/VAR*	AR	EA	FWSI	24344
L 012	999-01-01849	L,*FREQ/VAR*	AR	EA	FWSI	24344
L 013	999-01-01850	L,*FREQ/VAR*	AR	EA	FWSI	24344
L 014	999-01-01851	L,*FREQ/VAR*	AR	EA	FWSI	24344
L 015	999-01-01852	L,*FREQ/VAR*	AR	EA	FWSI	24344
L 016	999-01-01853	L,*FREQ/VAR*	AR	EA	FWSI	24344
L 017	999-01-01854	L,*FREQ/VAR*	AR	EA	FWSI	24344
L 018	999-01-01855	L,*FREQ/VAR*	AR	EA	FWSI	24344
L 019	999-01-01856	L,*FREQ/VAR*	AR	EA	FWSI	24344
L 020	999-01-01857	L,*FREQ/VAR*	AR	EA	FWSI	24344
L 021	999-01-01858	L,*FREQ/VAR*	AR	EA	FWSI	24344
L 022	999-01-01859	L,*FREQ/VAR*	AR	EA	FWSI	24344
L 023	999-01-01860	L,*FREQ/VAR*	AR	EA	FWSI	24344
L 024	999-01-01861	L,*FREQ/VAR*	AR	EA	FWSI	24344
L 025	999-01-01862	L,*FREQ/VAR*	AR	EA	FWSI	24344
L 026	999-01-01863	L,*FREQ/VAR*	AR	EA	FWSI	24344
L 027	999-01-01864	L,*FREQ/VAR*	AR	EA	FWSI	24344
L 028	999-01-01865	L,*FREQ/VAR*	AR	EA	FWSI	24344
P 001	065-98-00012	CONT,PCB MOUNT RECEPTACLE	1	EA	AMP	85861-4
P 002	065-98-00012	CONT,PCB MOUNT RECEPTACLE	1	EA	AMP	85861-4
P 003	065-98-00012	CONT,PCB MOUNT RECEPTACLE	1	EA	AMP	85861-4
P 004	065-98-00012	CONT,PCB MOUNT RECEPTACLE	1	EA	AMP	85861-4
P 029	065-98-00012	CONT,PCB MOUNT RECEPTACLE	1	EA	AMP	85861-4
Q 001	263-10-22221	XSTR,NPN 75V,DC/UHF AMPL	1	EA	FCH/MML	2N2222A
Q 002	263-10-22221	XSTR,NPN 75V,DC/UHF AMPL	1	EA	FCH/MML	2N2222A
Q 003	263-10-22221	XSTR,NPN 75V,DC/UHF AMPL	1	EA	FCH/MML	2N2222A
Q 004	263-10-22221	XSTR,NPN 75V,DC/UHF AMPL	1	EA	FCH/MML	2N2222A
R 001	616-02-10009	RES,100 OHM 5% 1/4W	1	EA	ALLEN BRAD	RC07GF101J
R 002	616-02-10009	RES,100 OHM 5% 1/4W	1	EA	ALLEN BRAD	RC07GF101J
R 003	616-02-47009	RES,470 OHM 5% 1/4W	1	EA	ALLEN BRAD	RC07GF471J
R 004	616-02-47009	RES,470 OHM 5% 1/4W	1	EA	ALLEN BRAD	RC07GF471J
R 005	616-02-10000	RES,1K 5% 1/4W	1	EA	ALLEN BRAD	RC07GF102J
R 006	999-01-01866	RES,*FREQ/VAR*	AR	EA	FWSI	24344

CONTINUED

PARTS LIST: 24992 MFR. NAME: FWSI PARENT STK. CONT. NO.: 205-89-01413

DESCRIPTION: PWA,DELAY LINE UM: EA ECO NO.: RCD CHG ENG. REV.: AA

ITEM NO.	COMPONENT STK. CONT. NO.	DESCRIPTION	QUANTITY	UM	MFR. NAME	MFR. PART/ASSY. NO.
R 007	616-02-12002	RES,120K 5% 1/4W	1	EA	ALLEN BRAD	RC07GF124J
R 008	623-02-10000	RES. 1K 5% 1W	1	EA	ALLEN BRAD	RC32GF102J
R 009	616-02-10009	RES,100 OHM 5% 1/4W	1	EA	ALLEN BRAD	RC07GF101J
R 010	616-02-10009	RES,100 OHM 5% 1/4W	1	EA	ALLEN BRAD	RC07GF101J
R 011	999-01-01867	RES,*FREQ/VAR*	AR	EA	FWSI	24344
R 012	616-02-47009	RES,470 OHM 5% 1/4W	1	EA	ALLEN BRAD	RC07GF471J
R 013	999-01-01868	RES,*FREQ/VAR*	AR	EA	FWSI	24344
R 014	616-02-47009	RES,470 OHM 5% 1/4W	1	EA	ALLEN BRAD	RC07GF471J
R 015	616-02-10000	RES,1K 5% 1/4W	1	EA	ALLEN BRAD	RC07GF102J
R 016	616-02-20000	RES,2K 5% 1/4W	1	EA	ALLEN BRAD	RC07GF202J
REF001	905-01-10007	SCHEM,PWA,DELAY LINE	AR	EA	FWSI	24990
REF002	905-05-00320	VARIABLE CHART,DELAY LINE	AR	EA	FWSI	24344
REF003	905-04-00001	SPEC,COMPONENT SPACING	AR	EA	FWSI	9500

END OF LIST

TECHNICAL MANUAL UTILITY REPORT

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